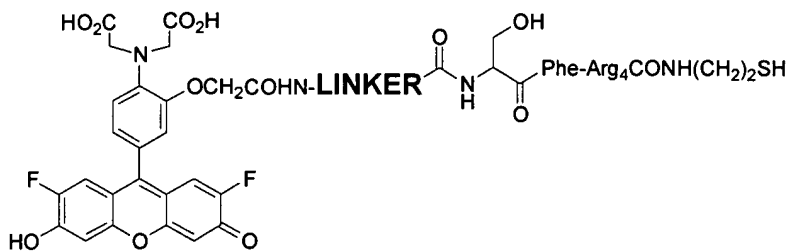
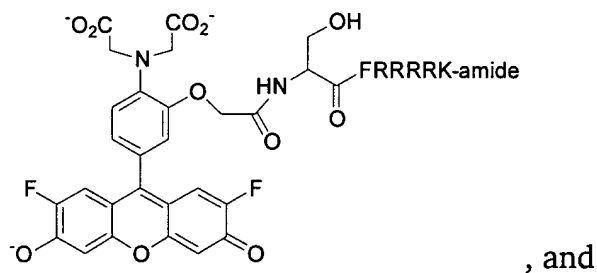
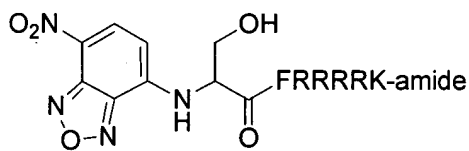


Amendments to the Claims:

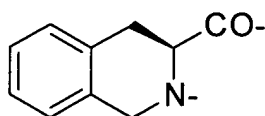
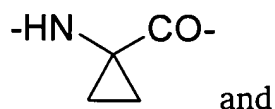
Please amend Claims 56, 57 and 59-62, and add new Claim 148 as set forth below.

1-48. (Canceled)

49. (Previously presented) A substrate for a protein kinase, wherein the substrate is selected from the group consisting of:



wherein F is phenylalanine, K is lysine, and R is arginine; and wherein the LINKER is selected from the group consisting of N-methyl glycine, L-proline, D-proline,



50-55. (Canceled)

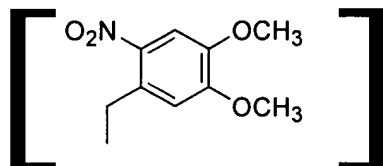
56. (Currently amended) A substrate for a protein kinase, wherein the substrate comprises:

a peptide substrate for the protein kinase, wherein the peptide comprises a serine, a threonine, or a tyrosine on a terminal end of the peptide;

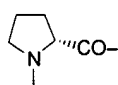
at least one fluorophore, wherein a fluorophore is attached to the serine, the threonine, or the tyrosine on the terminal end of the peptide; and

~~a photolabile side chain attached to the serine, the threonine, or the tyrosine on the terminal end of the peptide, wherein the photolabile side chain blocks transfer of a phosphoryl group from adenosine triphosphate to a hydroxyl moiety of the serine, the threonine, or the tyrosine so that the substrate cannot be phosphorylated by a protein kinase until the photolabile side chain is removed from the substrate; and~~

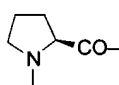
wherein the photolabile side chain comprises the structure



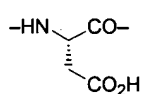
or a fluorophore is attached to the peptide by a linker selected from the group consisting of



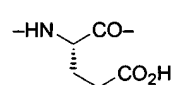
a



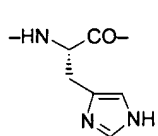
b



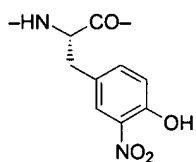
c



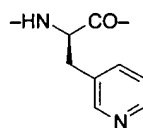
d



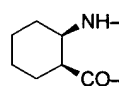
e



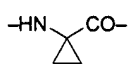
f



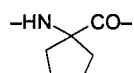
g



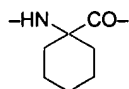
h



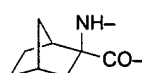
i



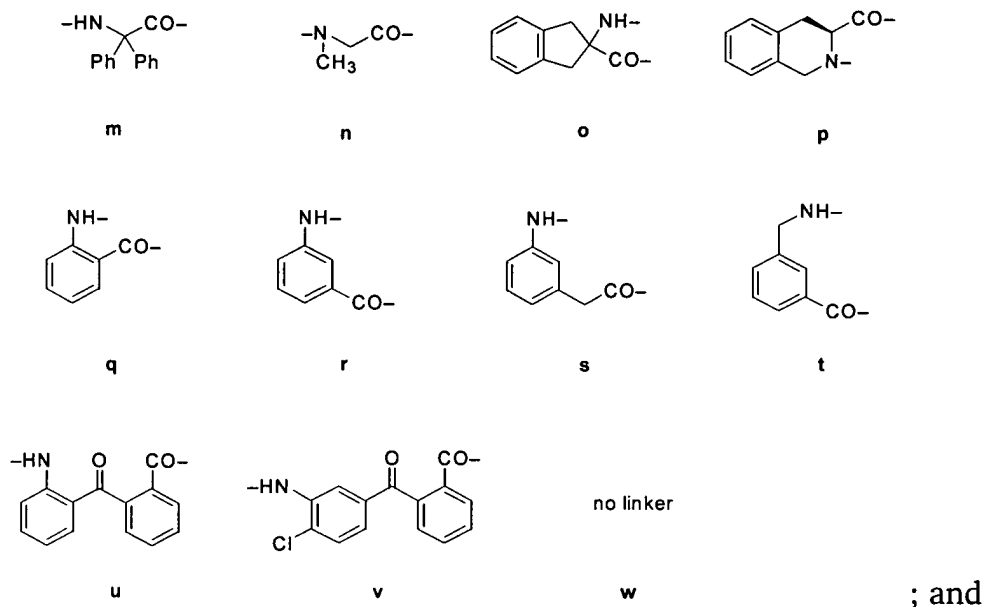
j



k



l



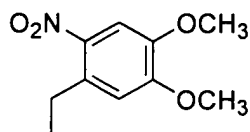
; and

wherein

- (i) the substrate is specific for a protein kinase subtype,
- (ii) the fluorophore is attached to the C-terminal end of the peptide,
- (iii) a fluorophore is attached to each terminal end of the peptide,
- (iv) a first fluorophore is attached to a terminal end of the peptide and a second fluorophore, with photophysical properties distinct from the first fluorophore, is attached to any nonterminal site on the peptide,
- (v) the fluorophore is a 7-nitrobenz-2-oxa-1,3-diazole derivative,
- (vi) the fluorophore is attached to the peptide by a linker selected from the group consisting of a carboxamide linker, an aminobenzoic acid linker, a sulfonamide linker, a urea linker, a thiourea linker, an ester linker, a thioester linker, an alkylamine linker, an arylamine linker, an ether linker, and a thioether linker, and/or
- (vii) the substrate further comprises a carbohydrate, a lipid or a nucleic acid.

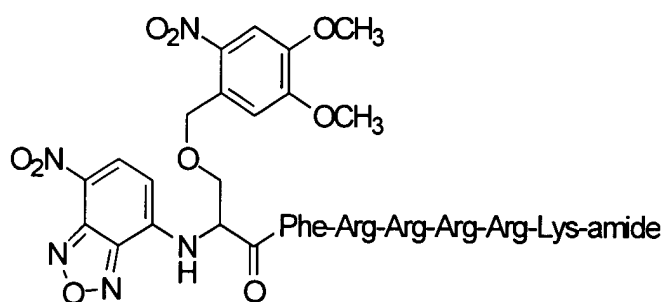
57. (Currently amended) The substrate of claim 148, ~~56~~, wherein the photolabile

side chain comprises the structure



58. (Original) The substrate of claim 56, wherein the substrate comprises a serine with a photolabile side chain that blocks phosphoryl transfer.

59. (Currently amended) The substrate of claim 56, ~~58~~, wherein the substrate has the structure



60. (Currently amended) The substrate of claim 148, ~~56~~, wherein after removal of the photolabile side chain, phosphorylation by a protein kinase of the terminal serine, the terminal threonine, or the terminal tyrosine to which the fluorophore is attached produces at least a 20% change in fluorescence intensity.

61. (Currently amended) The substrate of claim 148, ~~56~~, wherein after removal of the photolabile side chain, phosphorylation by a protein kinase of the terminal serine, the terminal threonine, or the terminal tyrosine to which the fluorophore is attached produces

at least a 20% increase in fluorescence intensity.

62. (Currently amended) The substrate of claim 148, ~~56~~, wherein after removal of the photolabile side chain, phosphorylation by a protein kinase of the terminal serine, the terminal threonine, or the terminal tyrosine to which the fluorophore is attached produces at least a 20% decrease in fluorescence intensity.

63. (Previously presented) The substrate of claim 60, wherein phosphorylation of the substrate by the protein kinase produces at least a 70% change in fluorescence intensity.

64. (Original) The substrate of claim 63, wherein phosphorylation of the substrate by the protein kinase produces at least a 100% change in fluorescence intensity.

65. (Original) The substrate of claim 64, wherein phosphorylation of the substrate by the protein kinase produces at least a 150% change in fluorescence intensity.

66. (Original) The substrate of claim 65, wherein phosphorylation of the substrate by the protein kinase produces at least a 250% change in fluorescence intensity.

67. (Previously presented) The substrate of claim 56, wherein the substrate is specific for a protein kinase subtype.

68. (Original) The substrate of claim 67, wherein the substrate is specific for protein kinase C.

69. (Original) The substrate of claim 68, wherein the substrate is specific for isoforms α , β , and γ of protein kinase C.

70. (Withdrawn) The substrate of claim 67, wherein the substrate is specific for protein kinase A, protein kinase B, protein kinase D, protein kinase G, Ca^{+} /calmodulin-dependent protein kinase, mitogen-activated protein kinase, protein kinase mos, protein kinase raf, protein tyrosine kinase, tyrosine kinase abl, tyrosine kinase src, tyrosine kinase yes, tyrosine kinase fps, tyrosine kinase met, cyclin-dependent protein kinase, or cdc2 kinase.

71. (Previously presented) The substrate of claim 56, wherein the substrate further comprises a carbohydrate, a lipid or a nucleic acid.

72. (Canceled)

73. (Previously presented) The substrate of claim 56, wherein the fluorophore is attached to the C-terminal end of the peptide.

74. (Previously presented) The substrate of claim 56, wherein the fluorophore is attached to the N-terminal end of the peptide.

75. (Previously presented) The substrate of claim 56, wherein a fluorophore is attached to each terminal end of the peptide.

76. (Original) The substrate of claim 75, wherein fluorophores with distinct photophysical properties are attached to different terminal ends of the peptide.

77. (Previously presented) The substrate of claim 56, wherein a first fluorophore is attached to a terminal end of the peptide and a second fluorophore, with photophysical properties distinct from the first fluorophore, is attached to any nonterminal site on the peptide.

78. (Previously presented) The substrate of claim 56, wherein the fluorophore is a 7-nitrobenz-2-oxa-1,3-diazole derivative.

79. (Withdrawn) The substrate of claim 56, wherein the fluorophore is a fluorescein derivative.

80. (Withdrawn) The substrate of claim 56, wherein the fluorophore is selected from the group consisting of a dansyl derivative, an acridine derivative, an Alexa Fluor derivative, a BODIPY derivative, an Oregon Green derivative, a Rhodamine Green derivative, a Rhodamine Red-X derivative, a Texas Red derivative, a Cascade Blue derivative, a Cascade Yellow derivative, a Marina Blue derivative, a Pacific Blue derivative, an AMCA-X derivative, and a coumarin derivative.

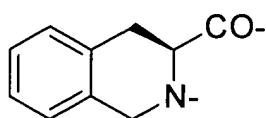
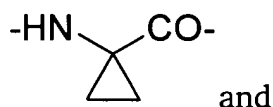
81. (Canceled)

82. (Withdrawn) The substrate of claim 56, wherein the fluorophore is attached to the peptide by a metal chelating linker.

83. (Previously presented) The substrate of claim 56, wherein the fluorophore is attached to the peptide by a linker selected from the group consisting of a carboxamide

linker, an aminobenzoic acid linker, a sulfonamide linker, a urea linker, a thiourea linker, an ester linker, a thioester linker, an alkylamine linker, an arylamine linker, an ether linker, and a thioether linker.

84. (Withdrawn) The substrate of claim 56, wherein the fluorophore is attached to the peptide by a linker selected from the group consisting of N-methyl glycine, L-proline, D-proline,



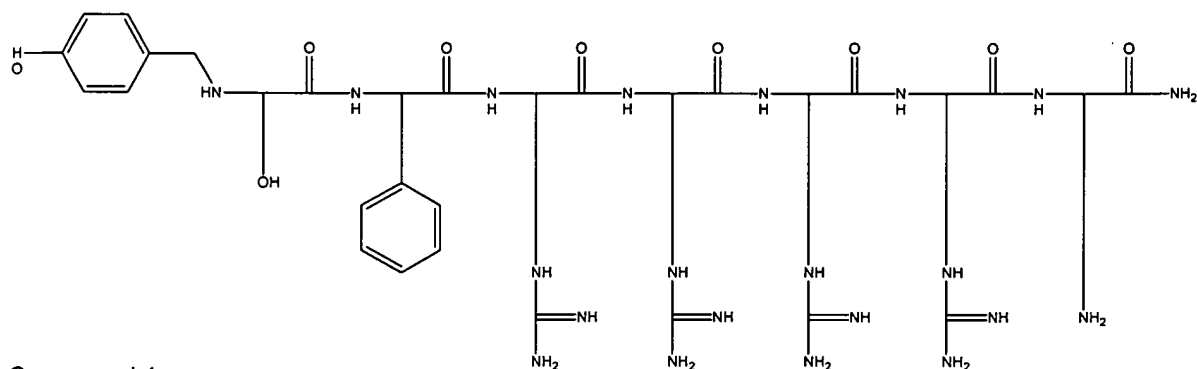
85. (Canceled)

86. (Previously presented) A composition comprising the substrate of claim 56, and a carrier.

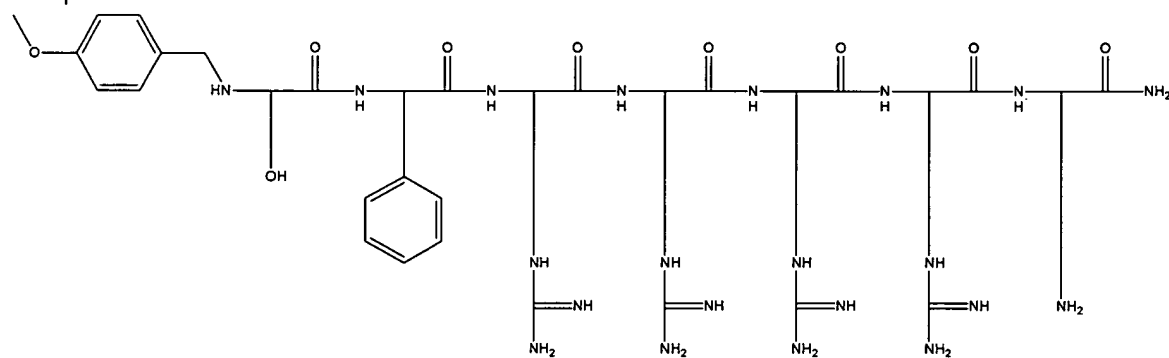
87. (Original) The composition of claim 86, wherein the composition is a pharmaceutical composition and the carrier is a pharmaceutically acceptable carrier.

88. (Previously presented) A chemical compound selected from the group of compounds consisting of:

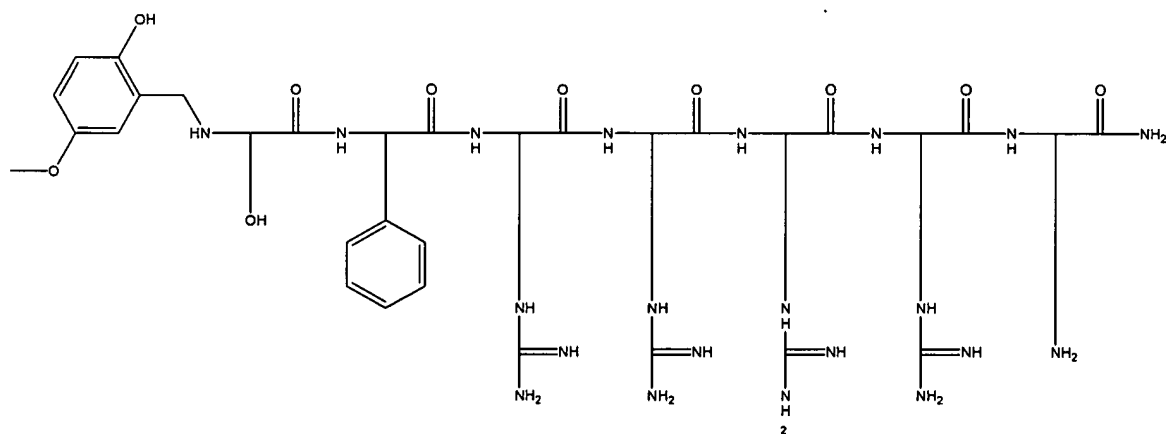
Applicant: David S. Lawrence
Serial No.: 10/755,086
Filed: January 9, 2004
page 11 of 190



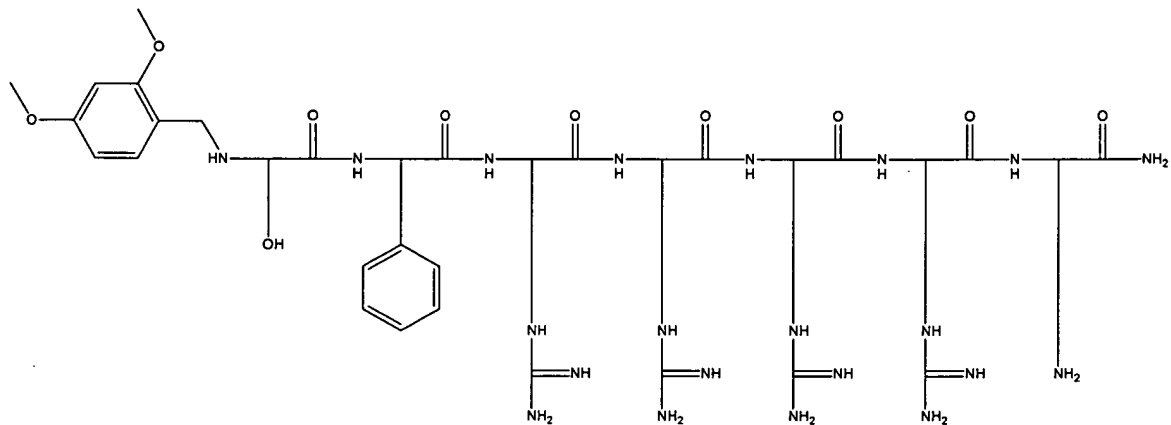
Compound 1



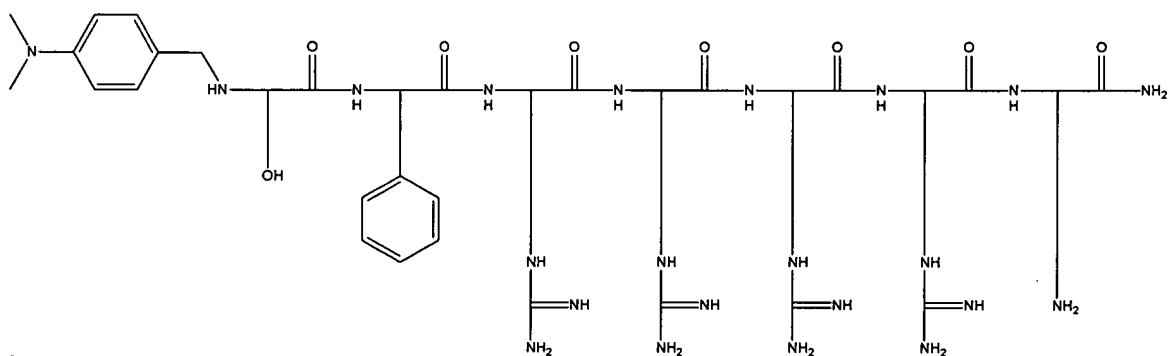
Compound 2



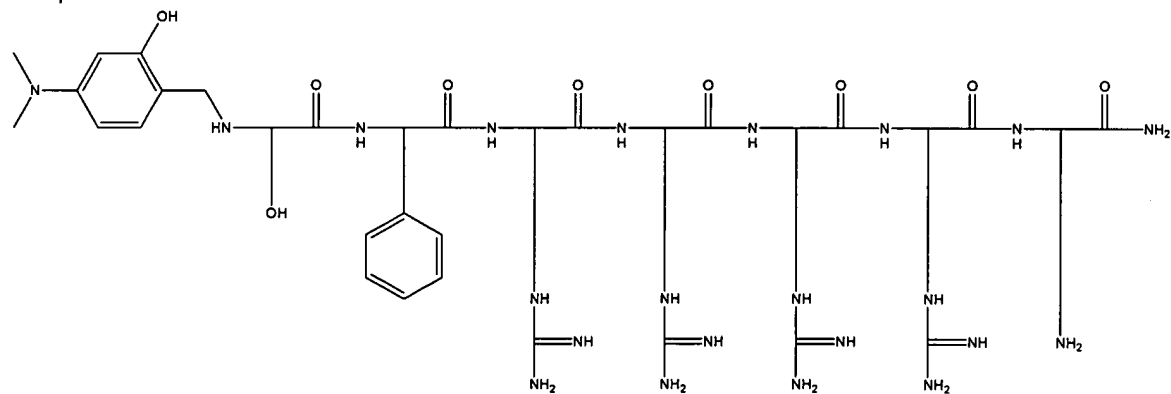
Compound 3



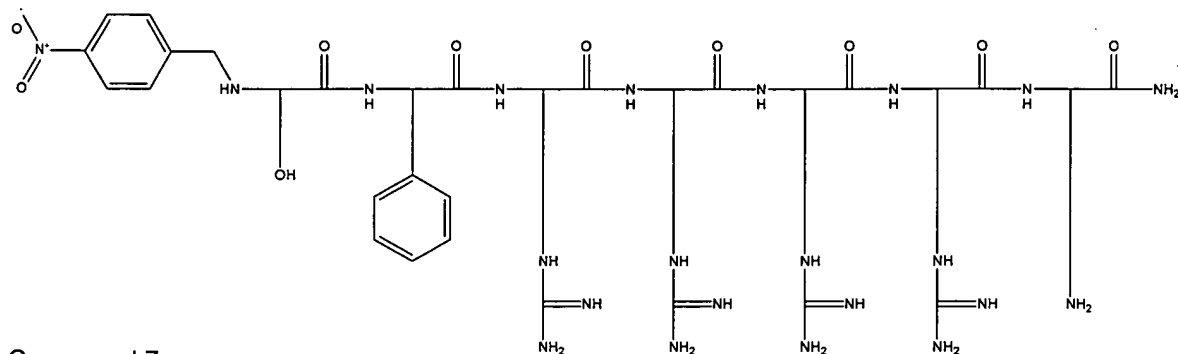
Compound 4



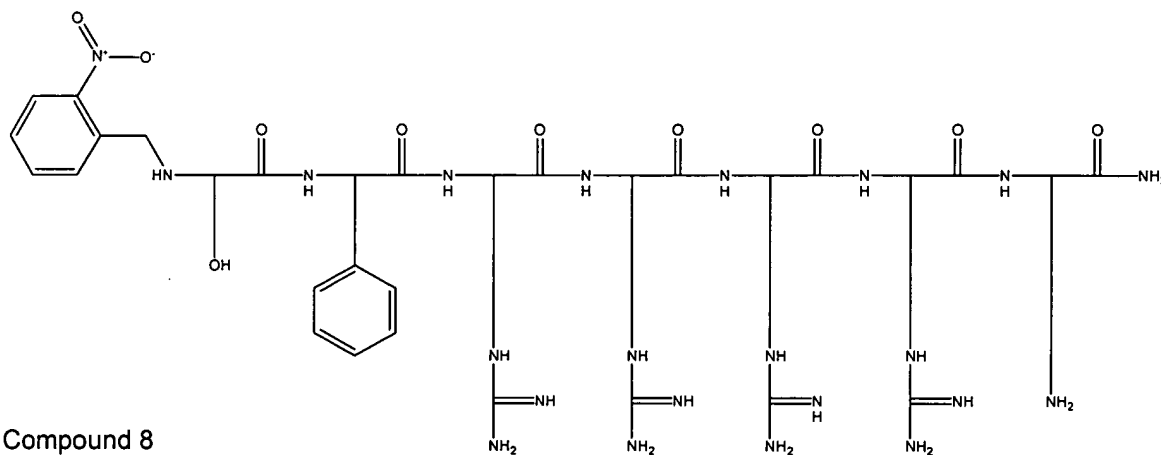
Compound 5



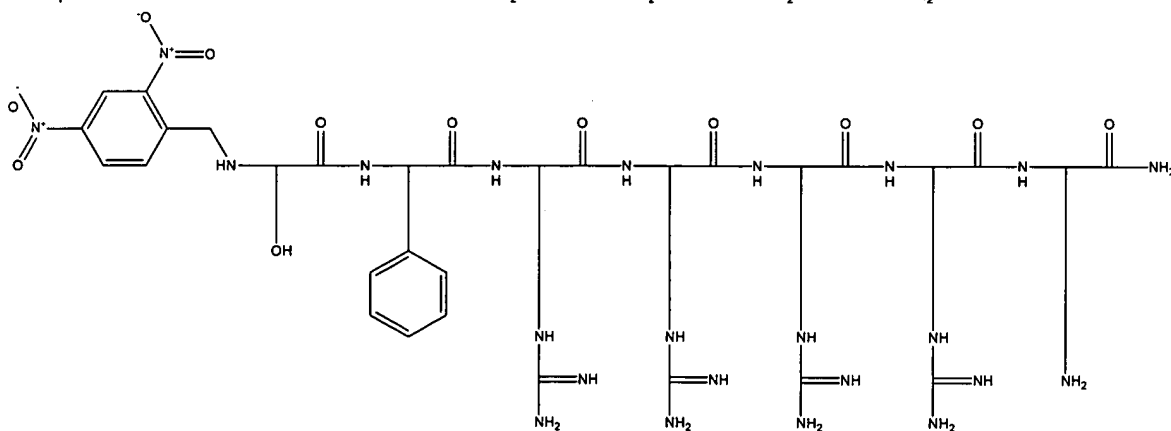
Compound 6



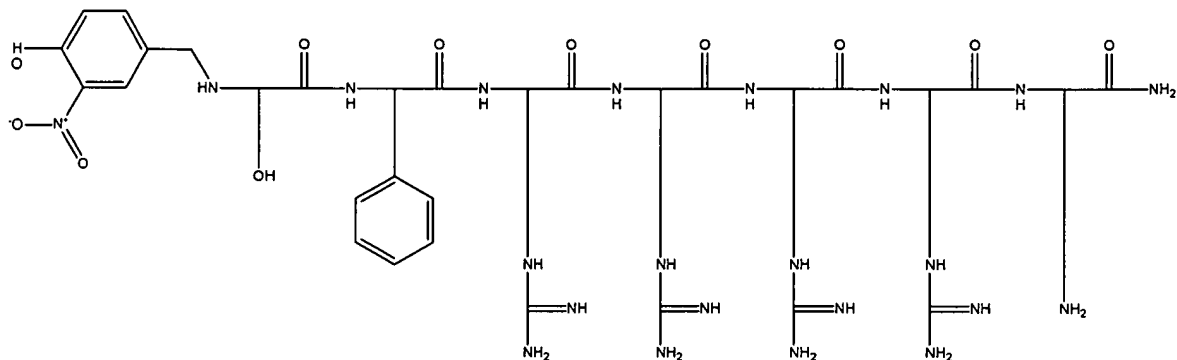
Compound 7



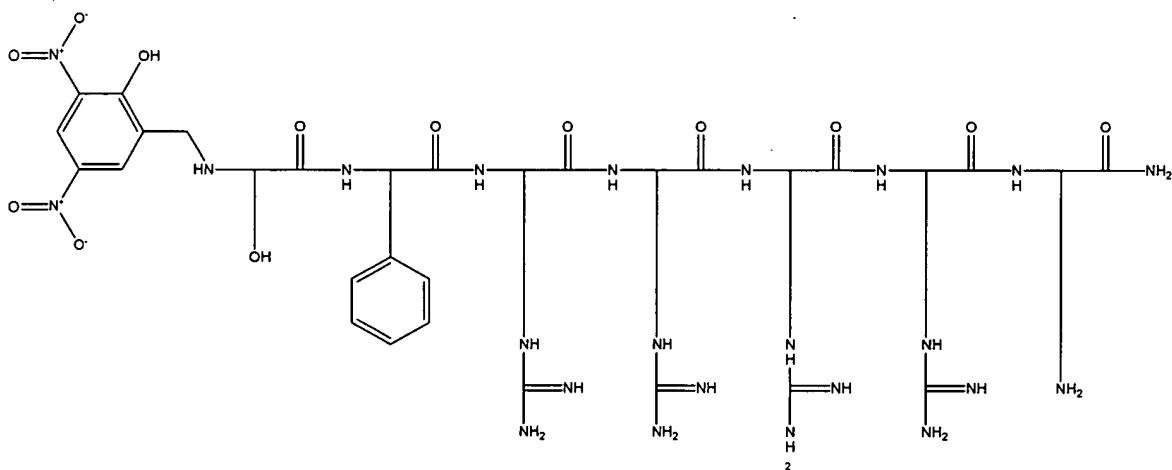
Compound 8



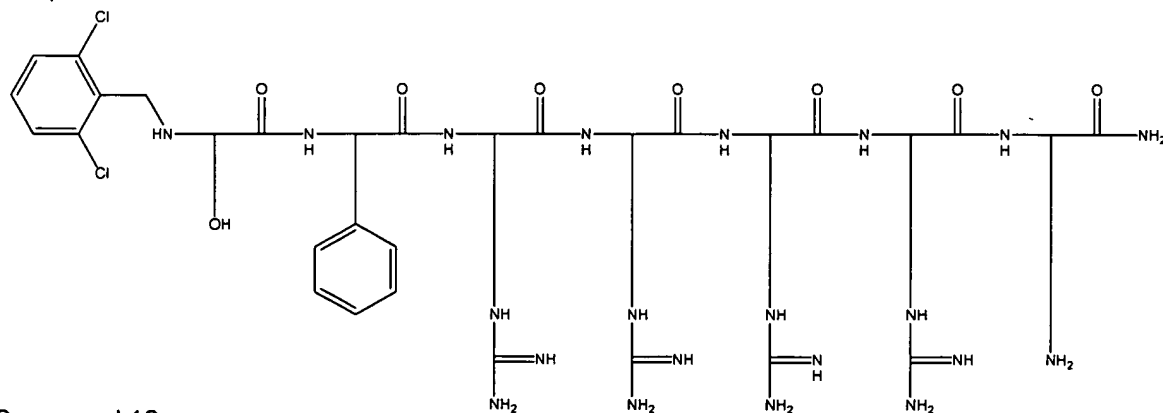
Compound 9



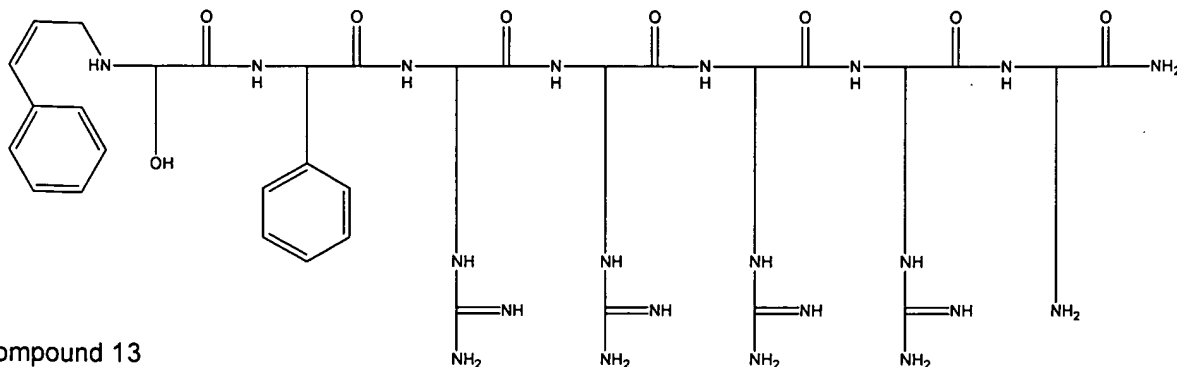
Compound 10



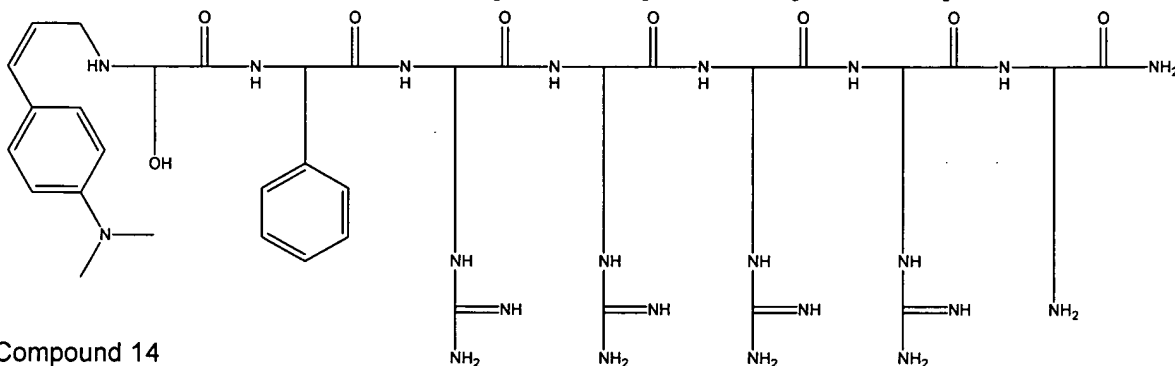
Compound 11



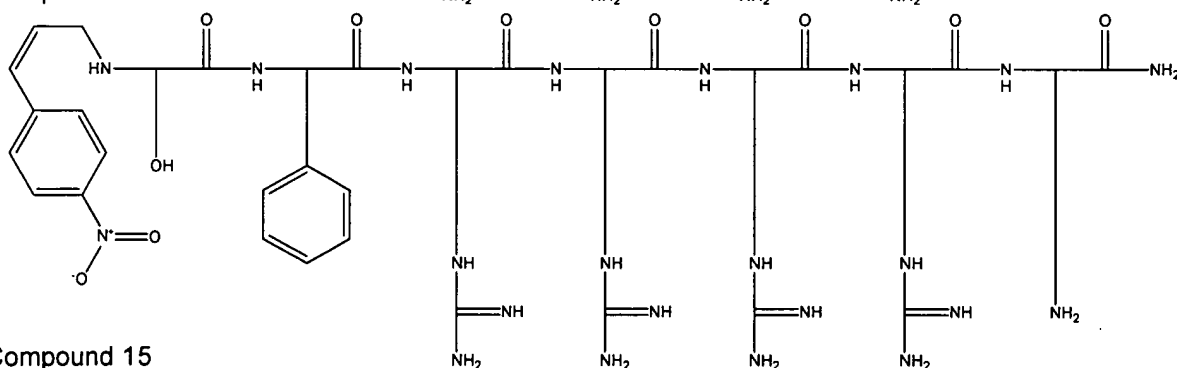
Compound 12



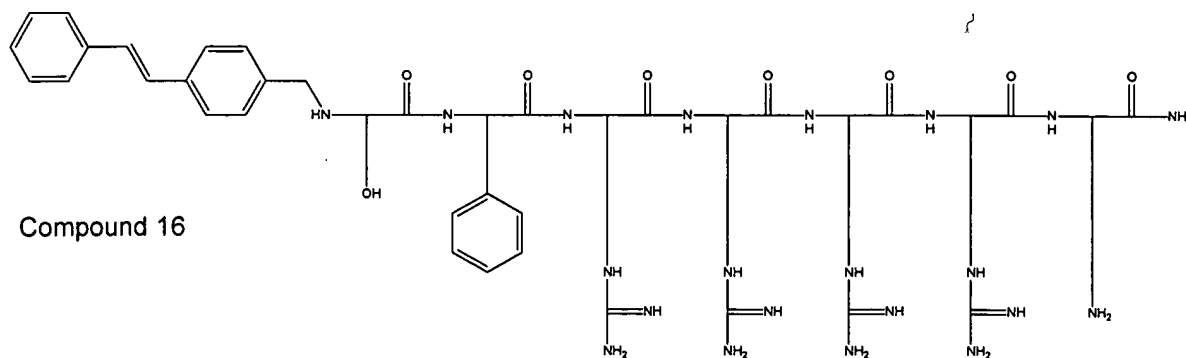
Compound 13



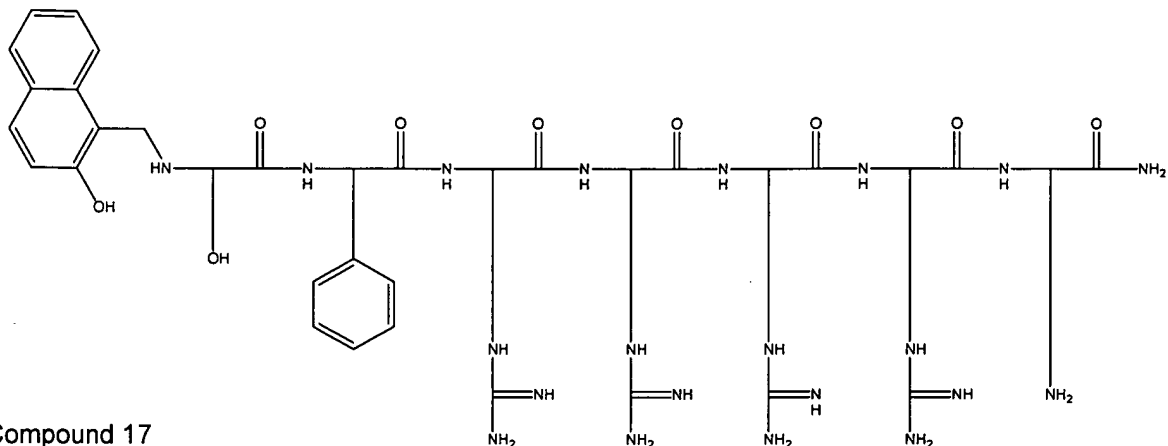
Compound 14



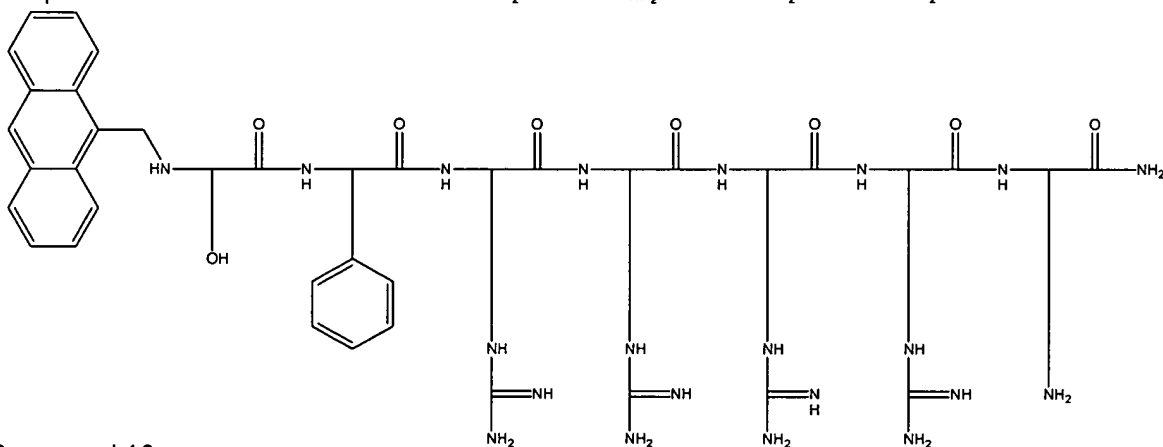
Compound 15



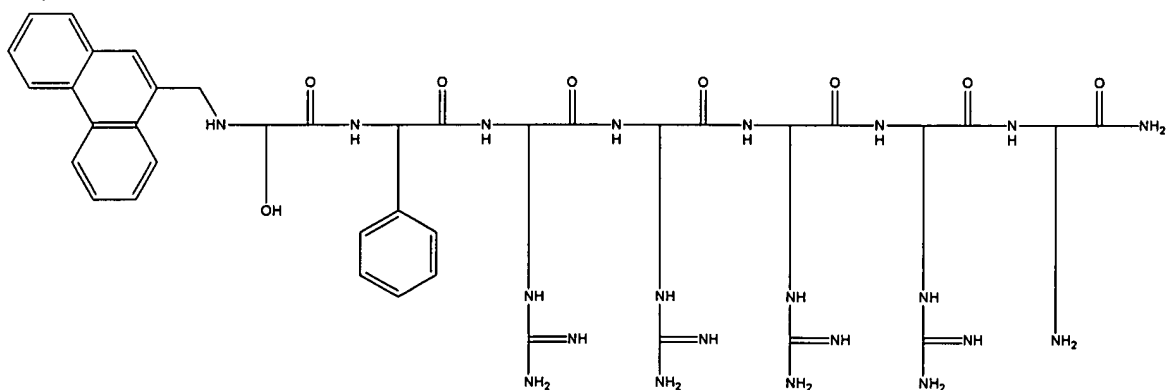
Compound 16



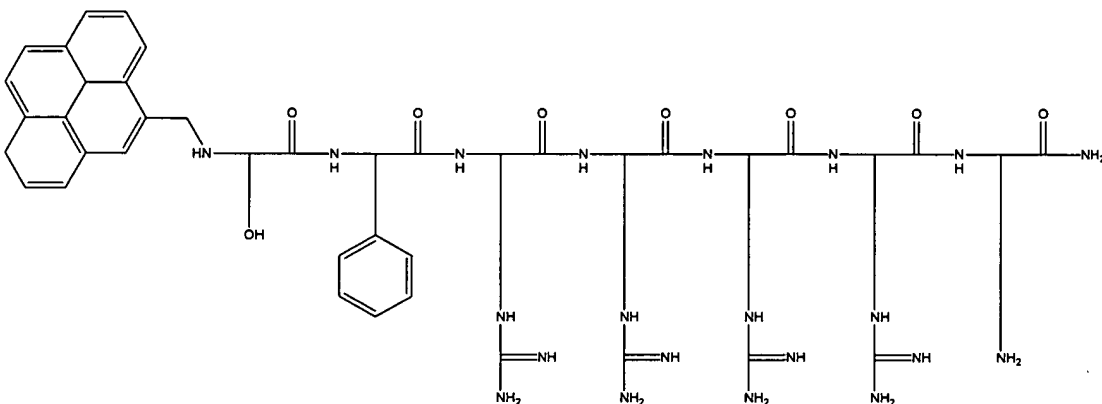
Compound 17



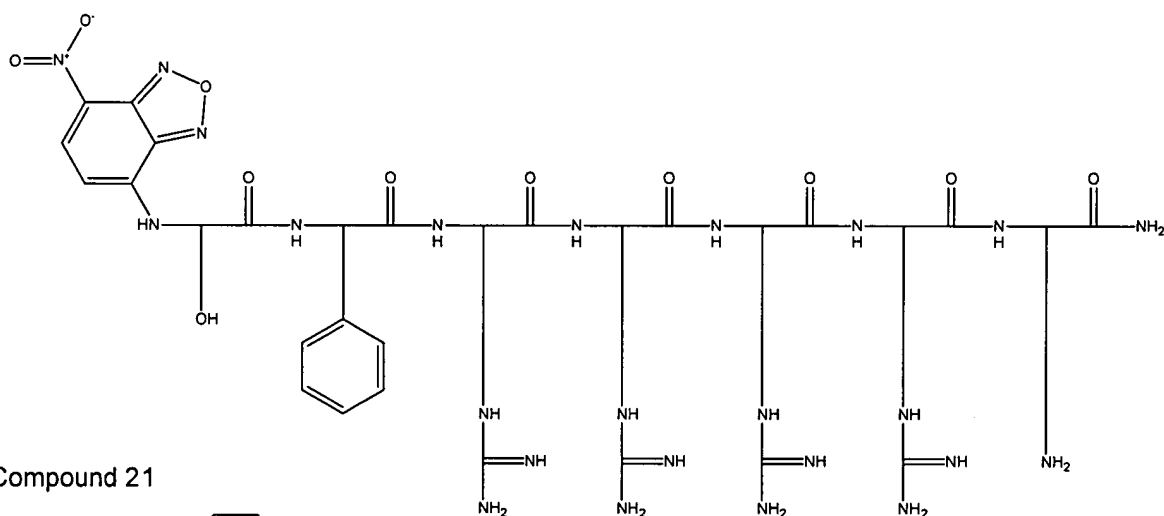
Compound 18



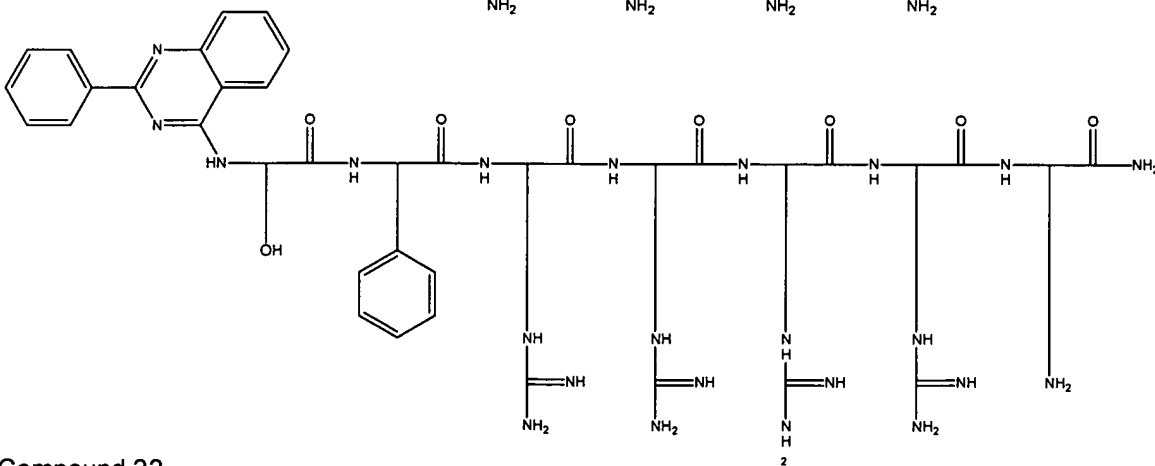
Compound 19



Compound 20

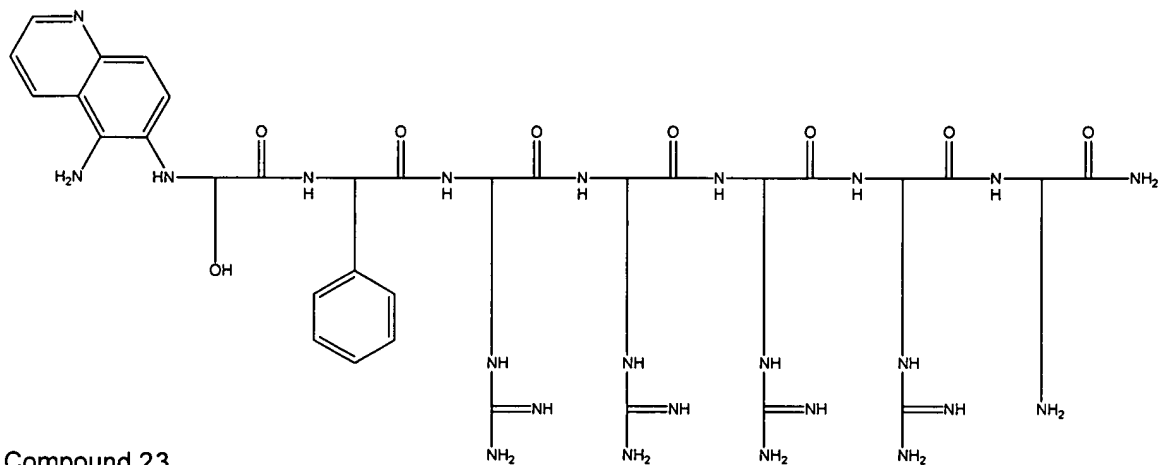


Compound 21

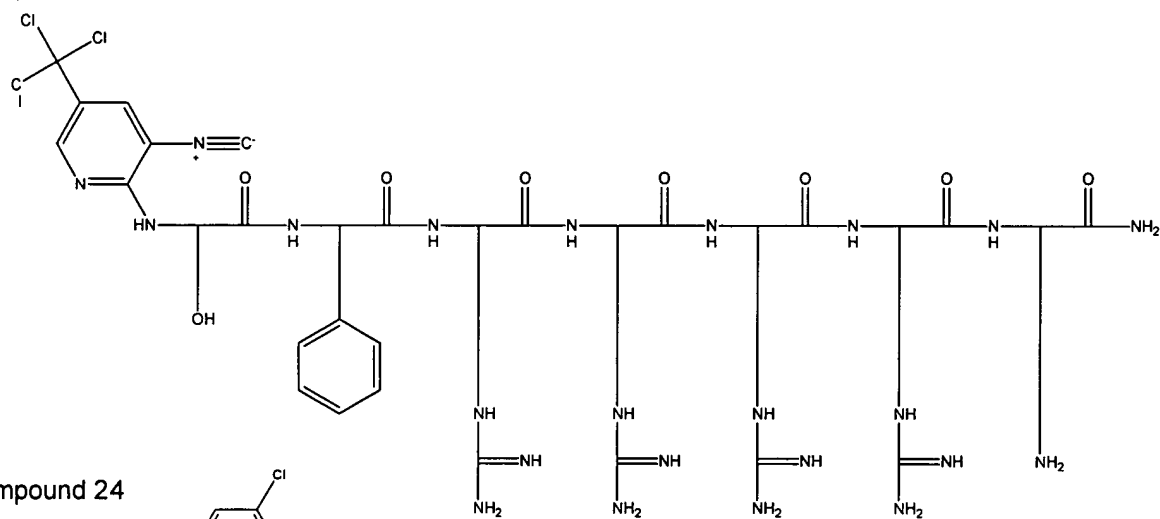


Compound 22

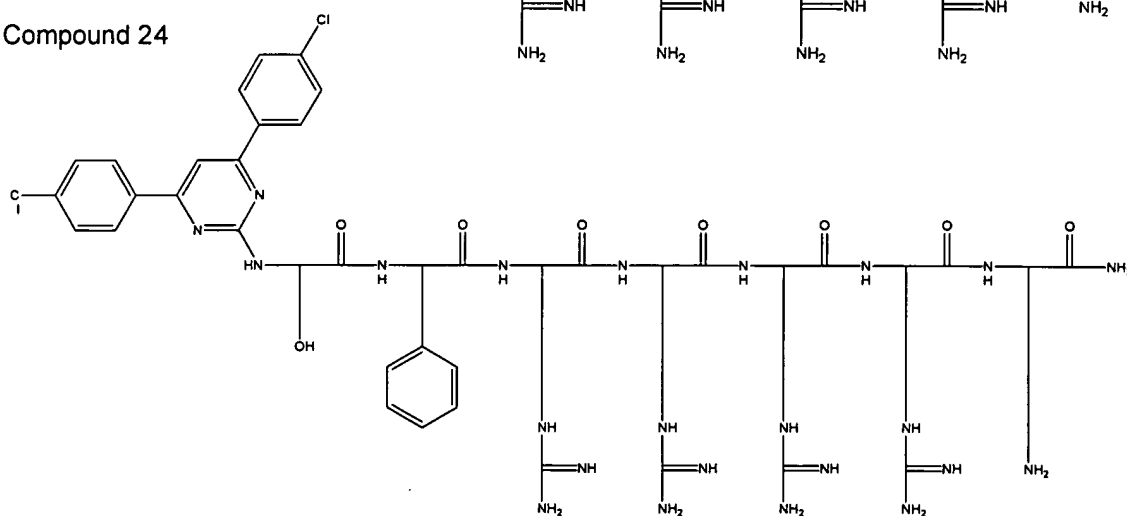
Applicant: David S. Lawrence
Serial No.: 10/755,086
Filed: January 9, 2004
page 18 of 190



Compound 23

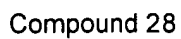


Compound 24

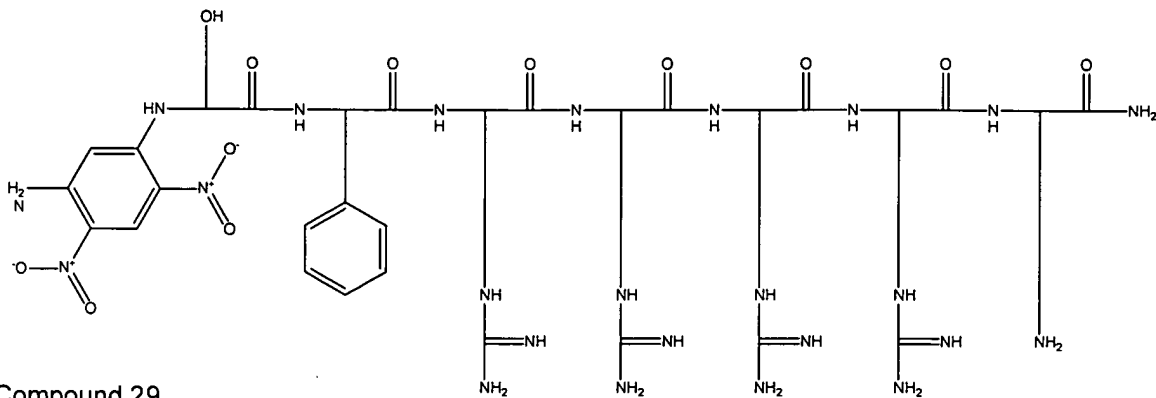


Compound 25

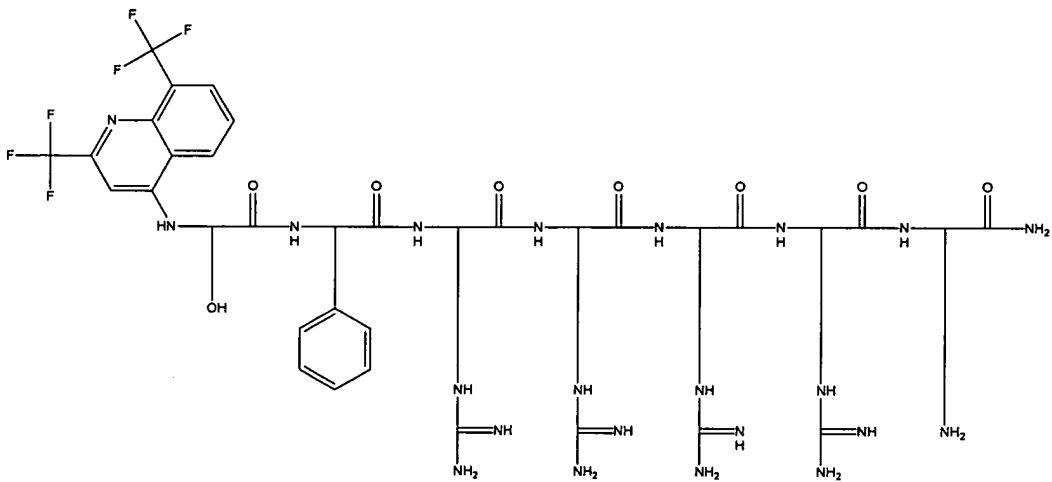
page 19 of 190



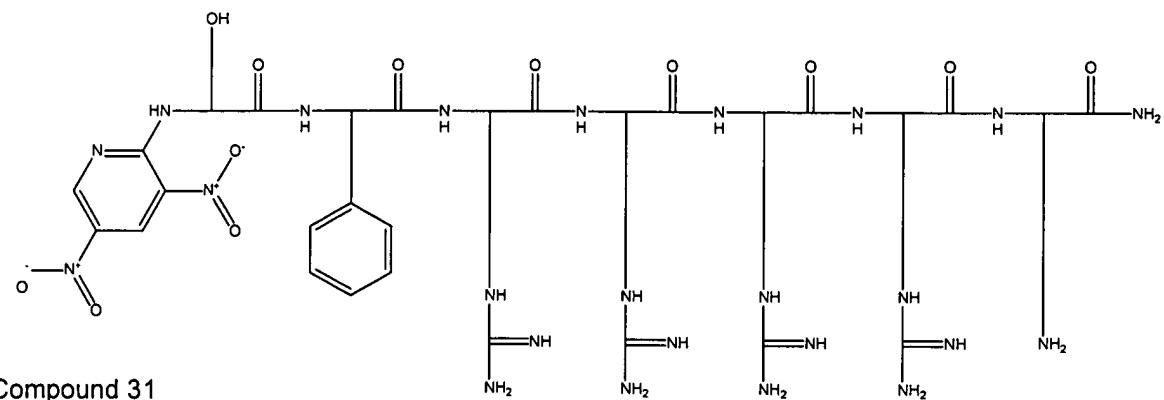
page 20 of 190



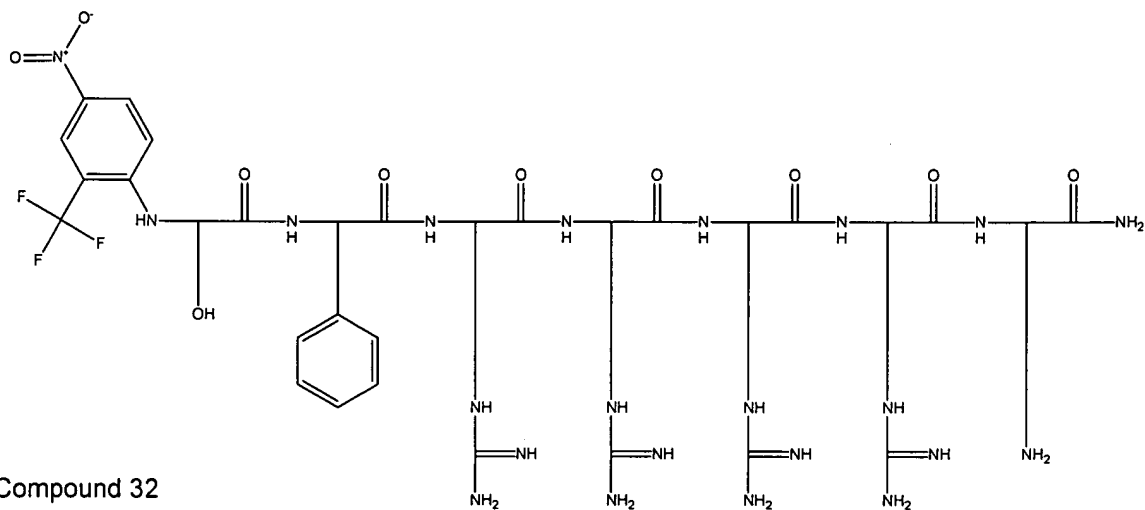
Compound 29



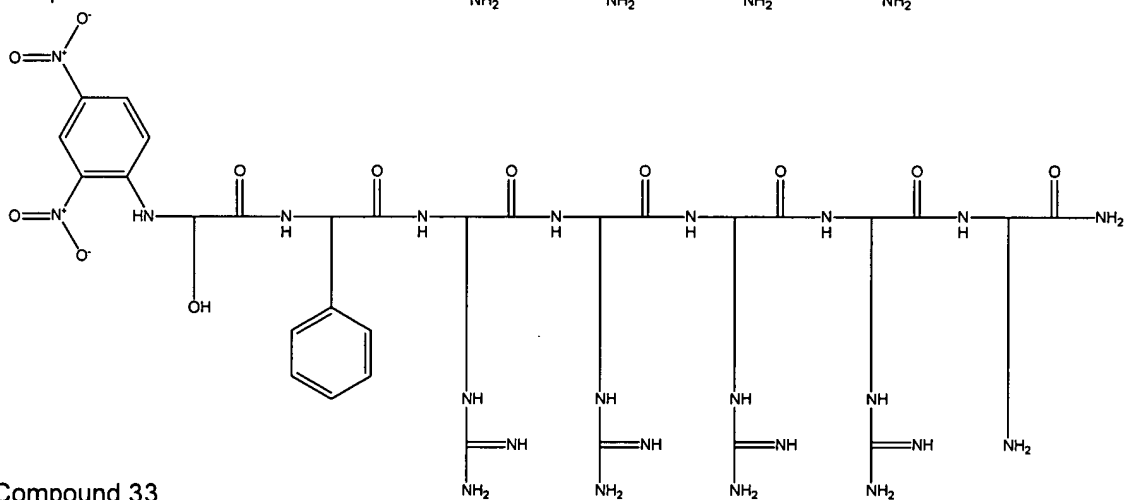
Compound 30



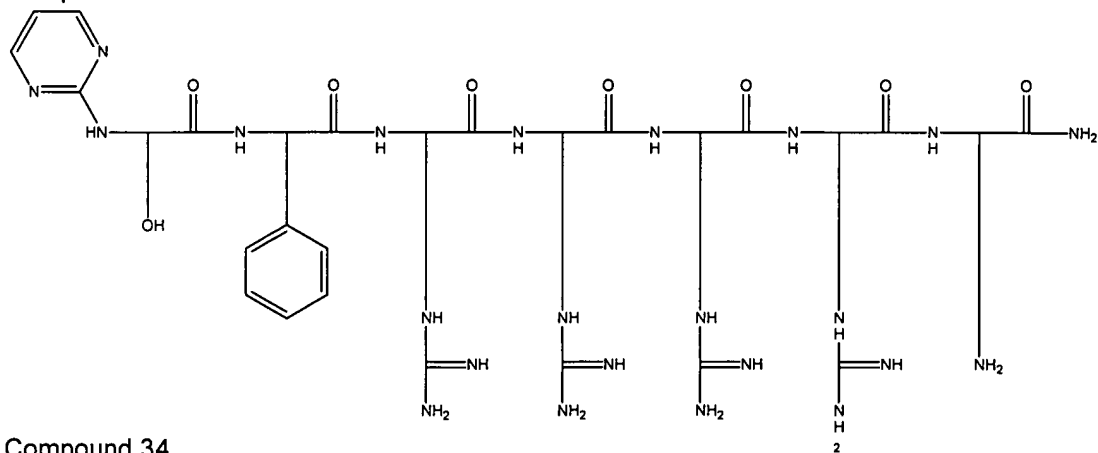
Compound 31



Compound 32

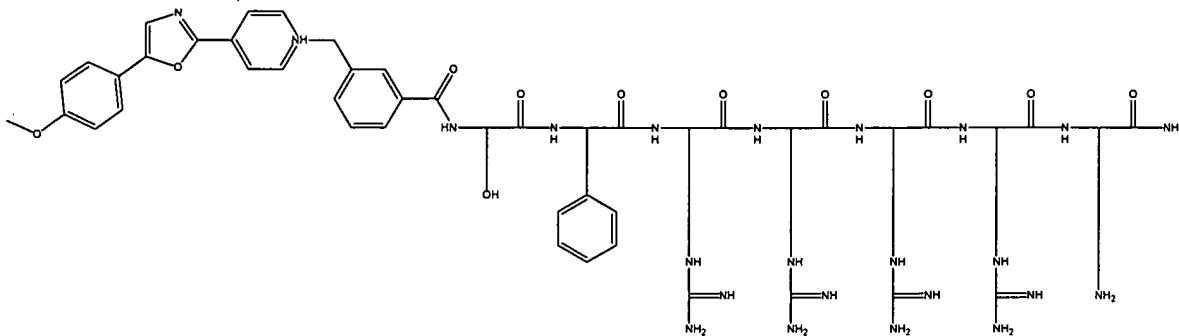


Compound 33

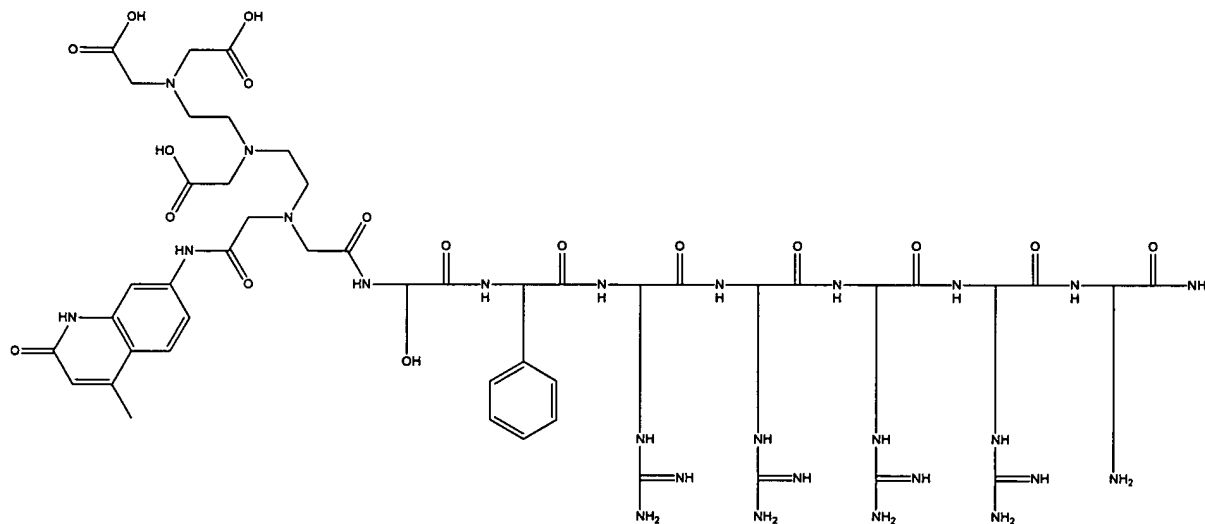


Compound 34

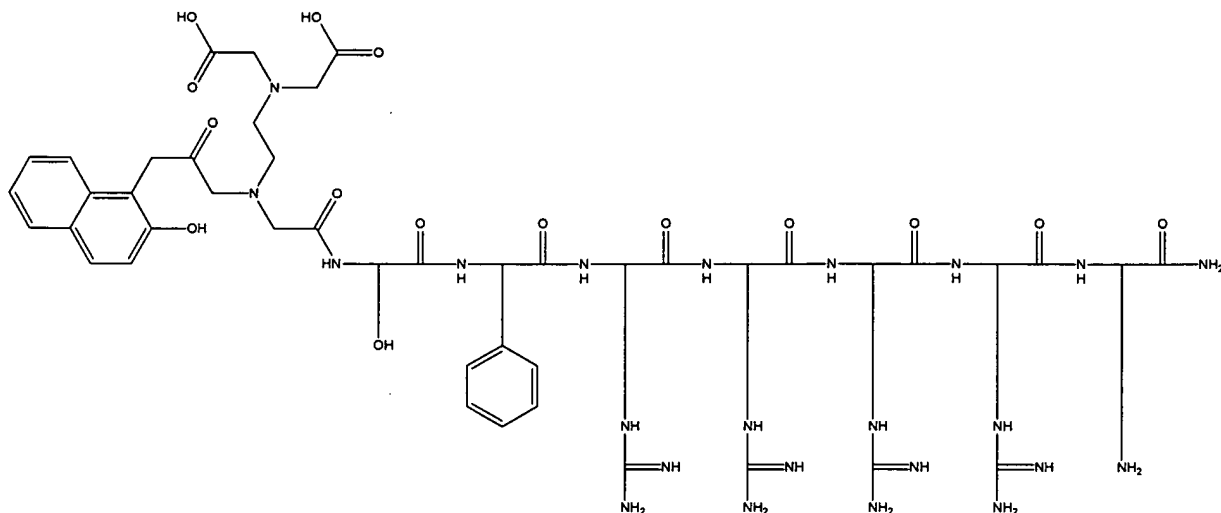
page 22 of 190



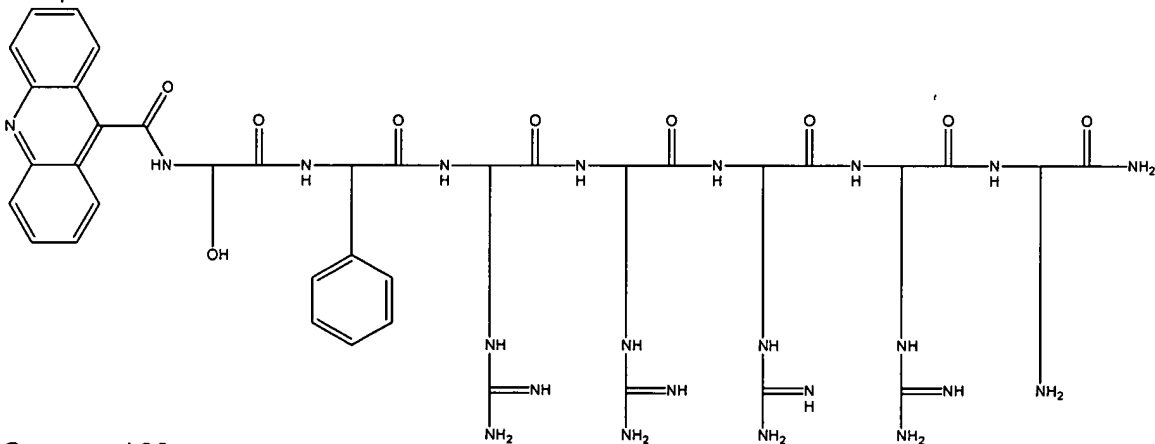
Compound 35



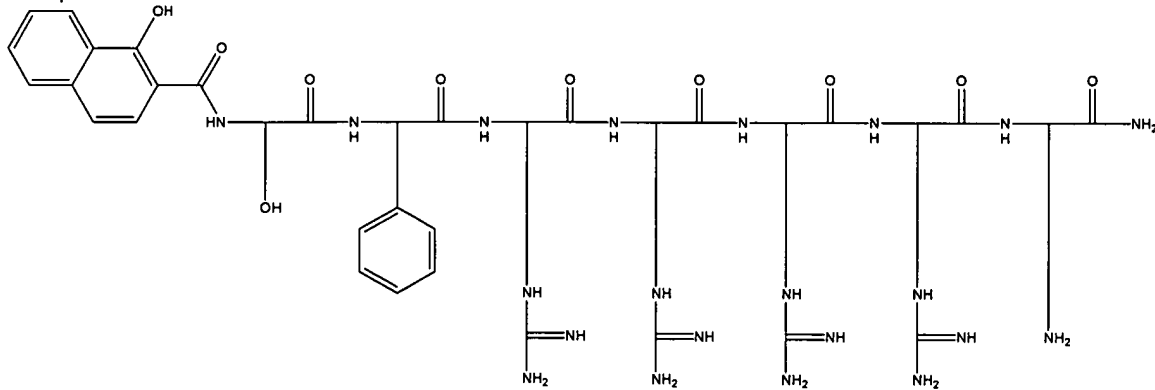
Compound 36



Compound 37

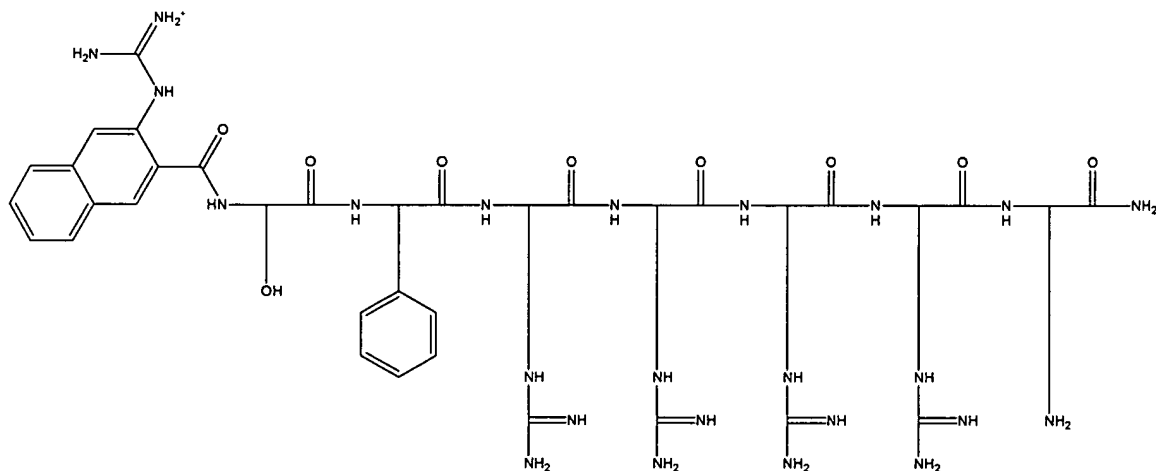


Compound 38

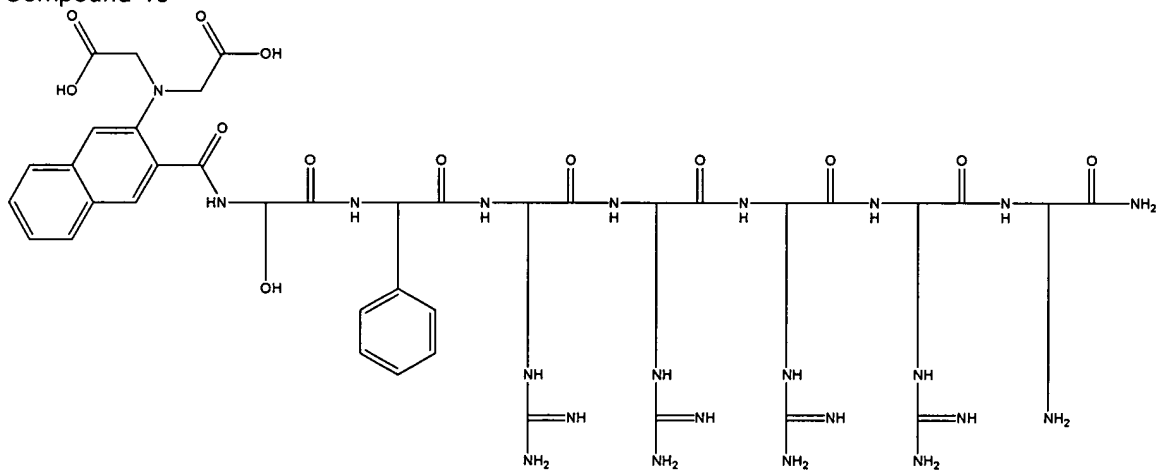


Compound 39

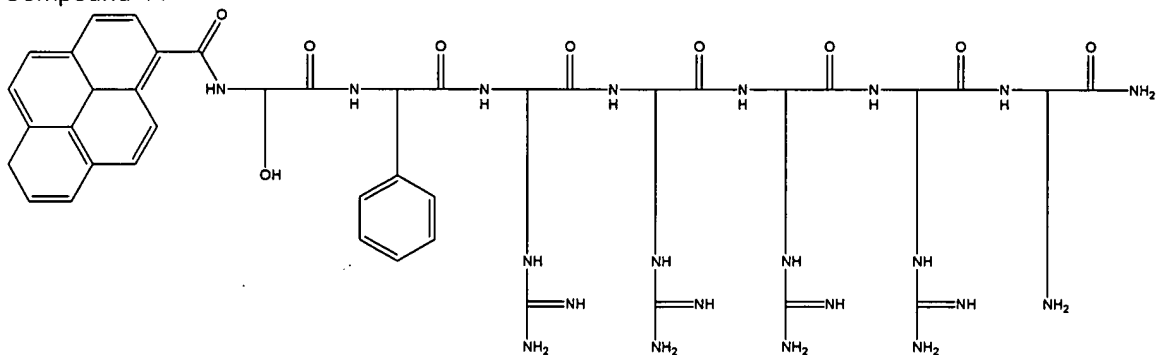
Applicant: David S. Lawrence
Serial No.: 10/755,086
Filed: January 9, 2004
page 24 of 190



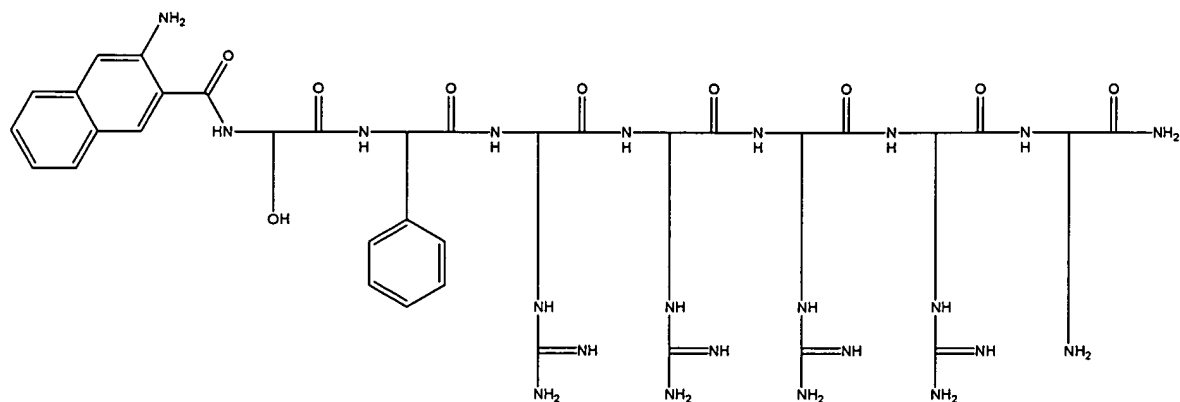
Compound 40



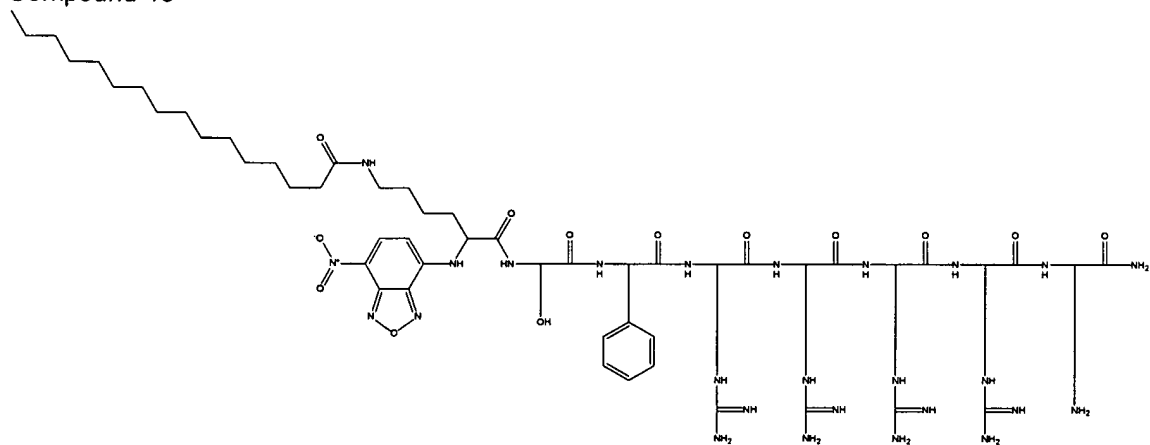
Compound 41



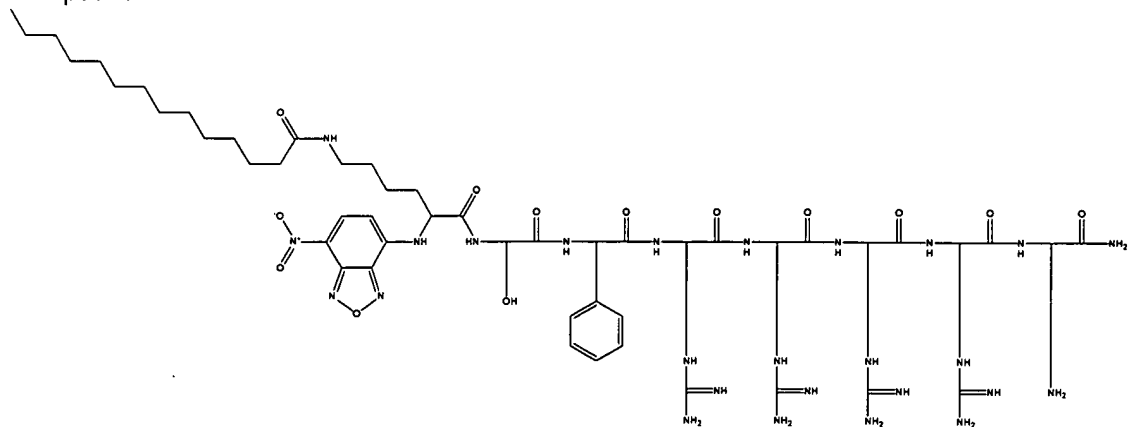
Compound 42



Compound 43

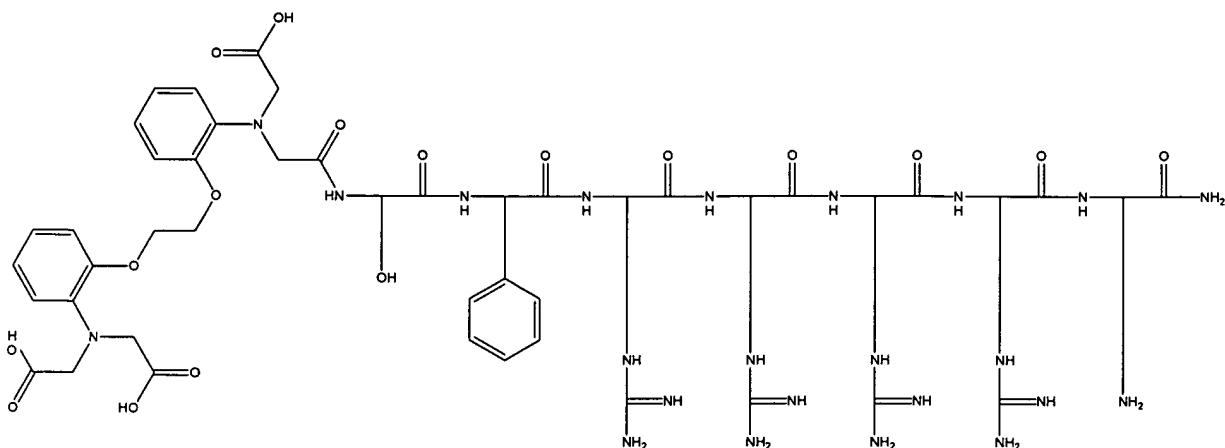


Compound 44

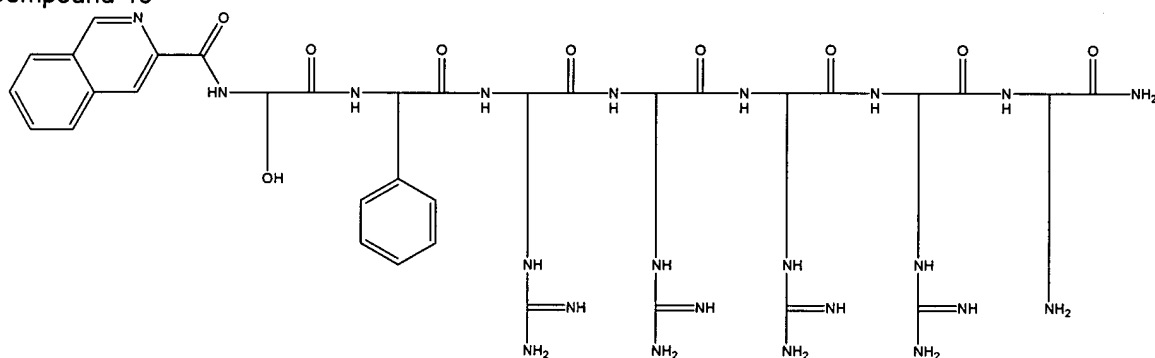


Compound 45

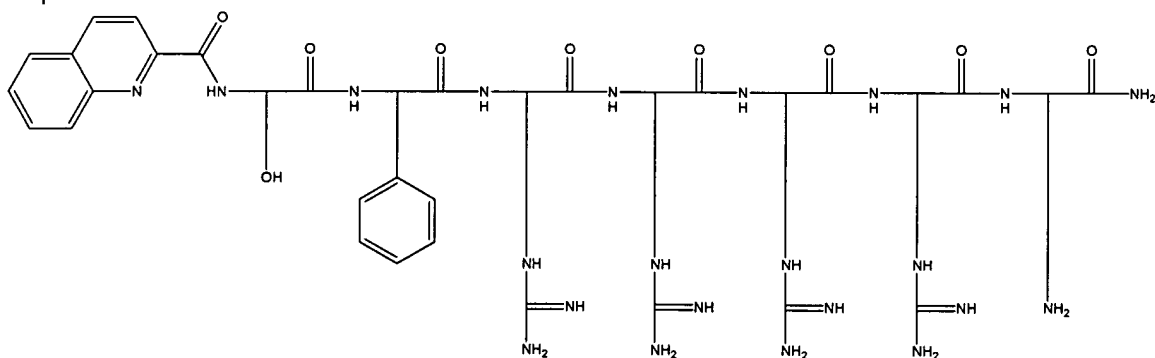
page 26 of 190



Compound 46

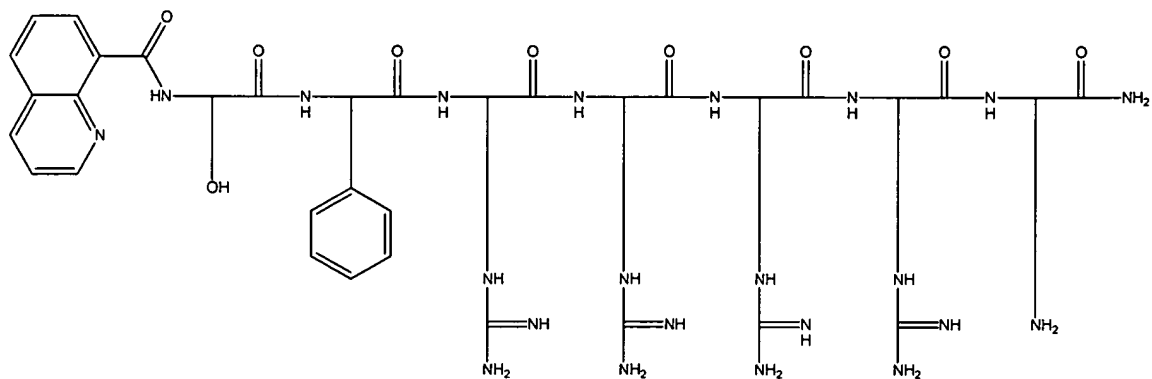


Compound 47

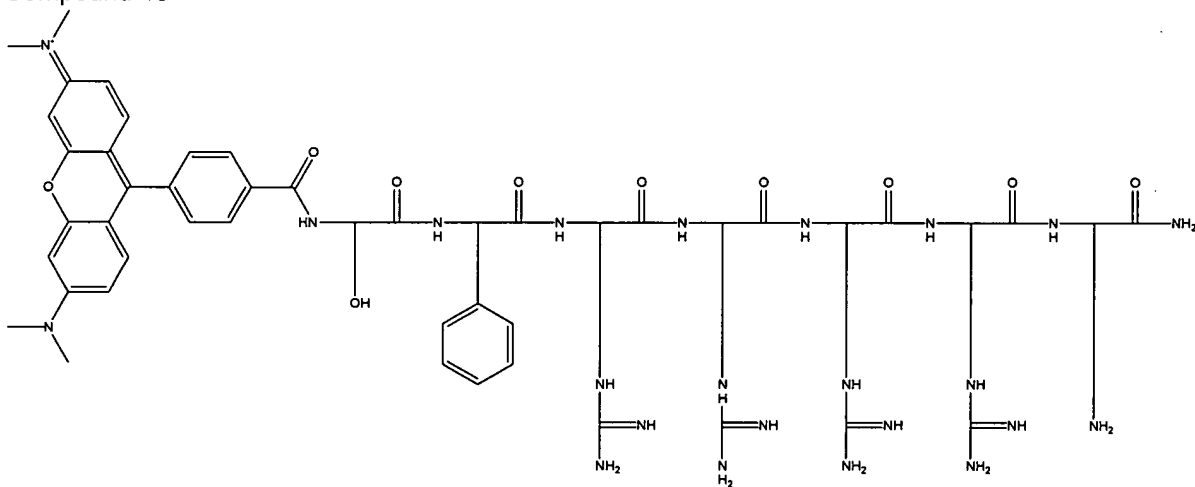


Compound 48

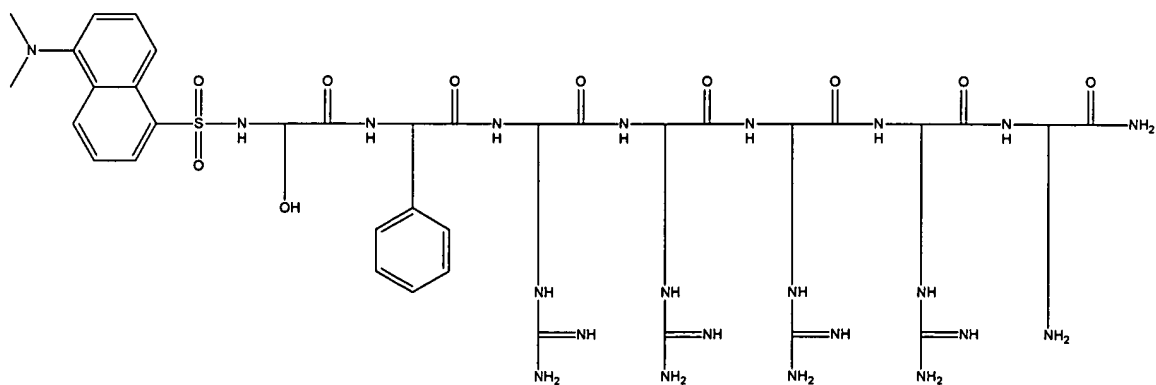
Applicant: David S. Lawrence
Serial No.: 10/755,086
Filed: January 9, 2004
page 27 of 190



Compound 49



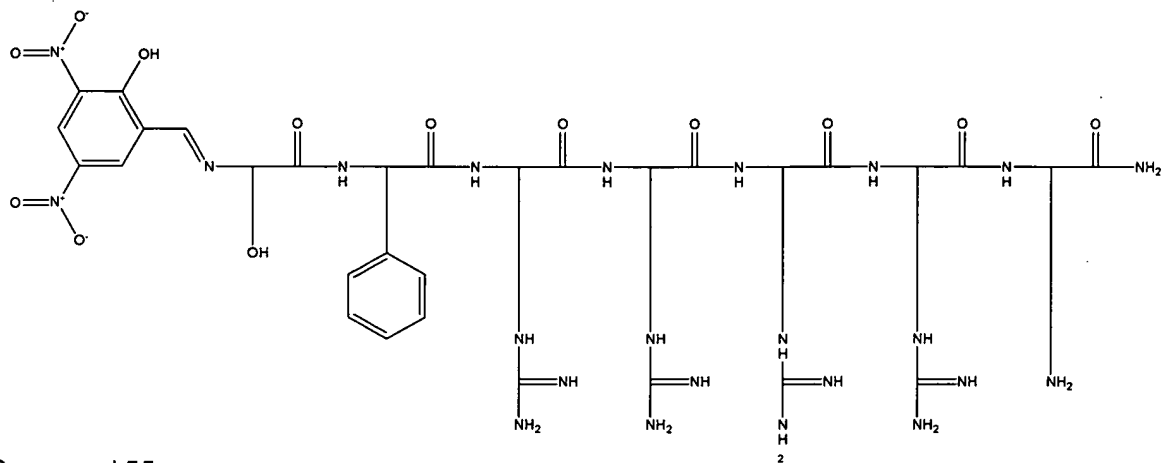
Compound 50



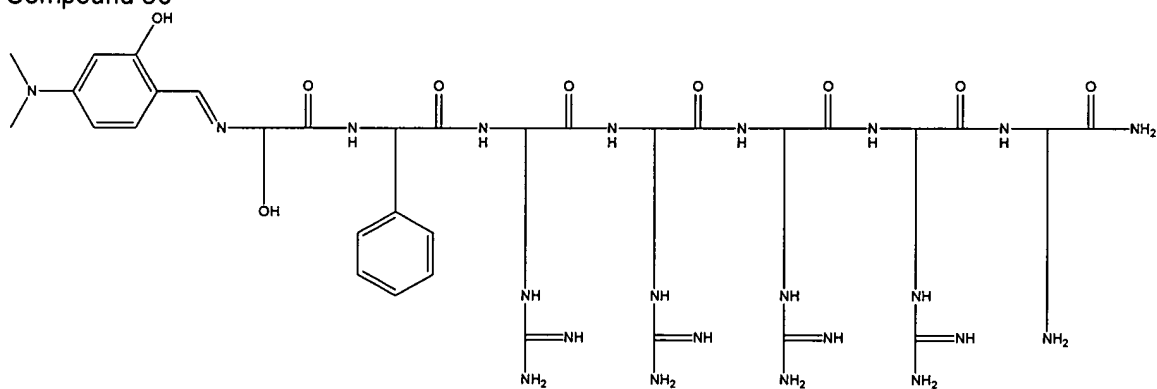
Compound 51

page 28 of 190

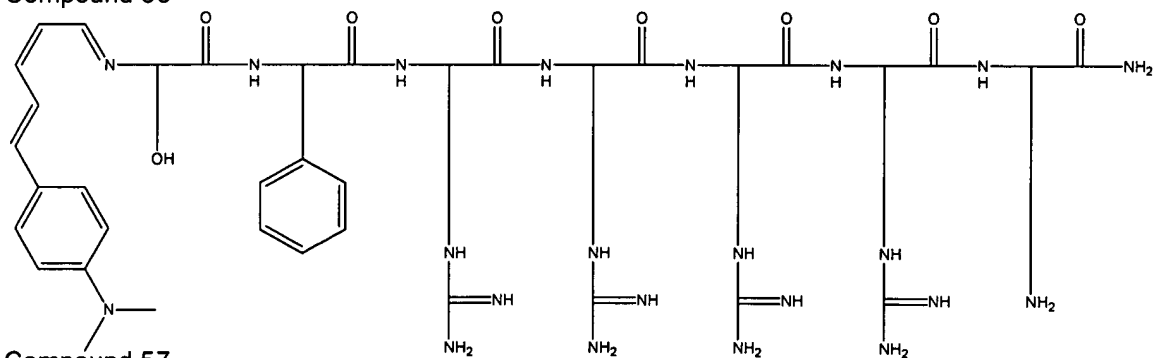




Compound 55



Compound 56



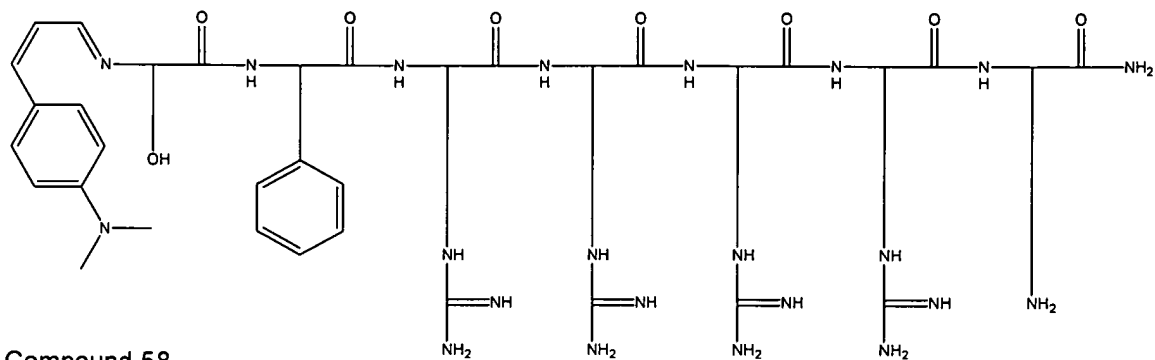
Compound 57

Applicant: David S. Lawrence

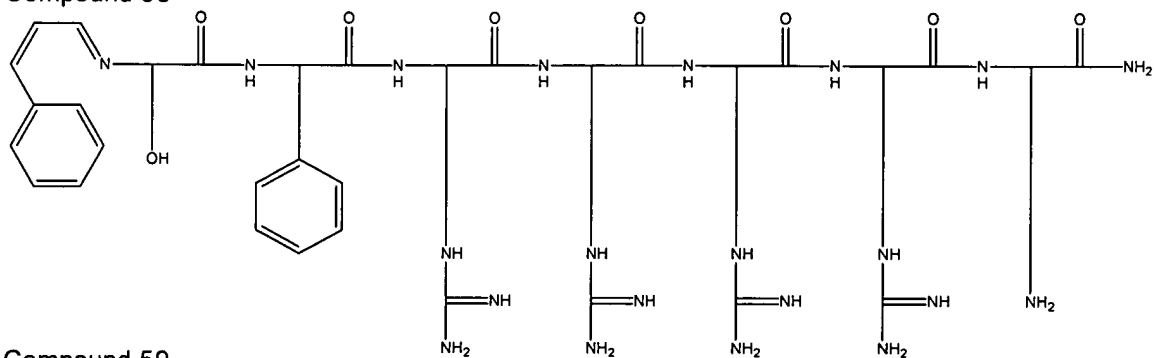
Serial No.: 10/755,086

Filed: January 9, 2004

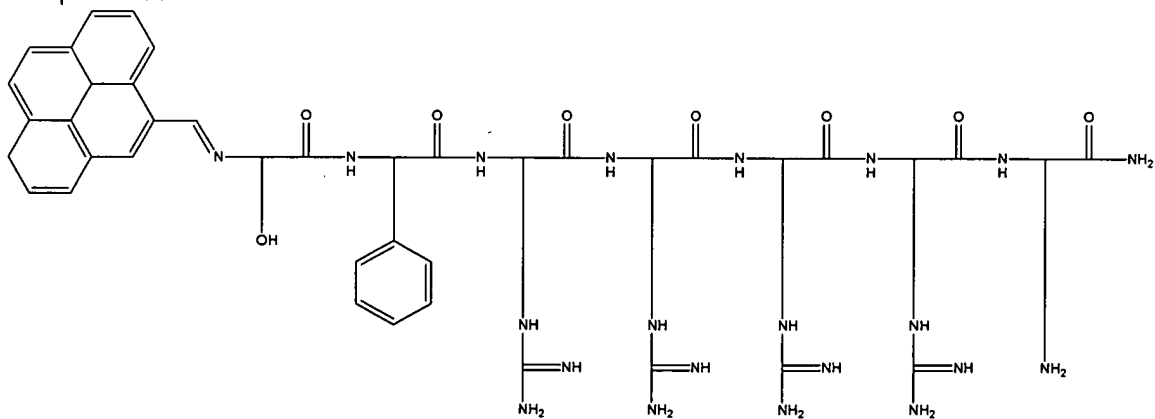
page 30 of 190



Compound 58

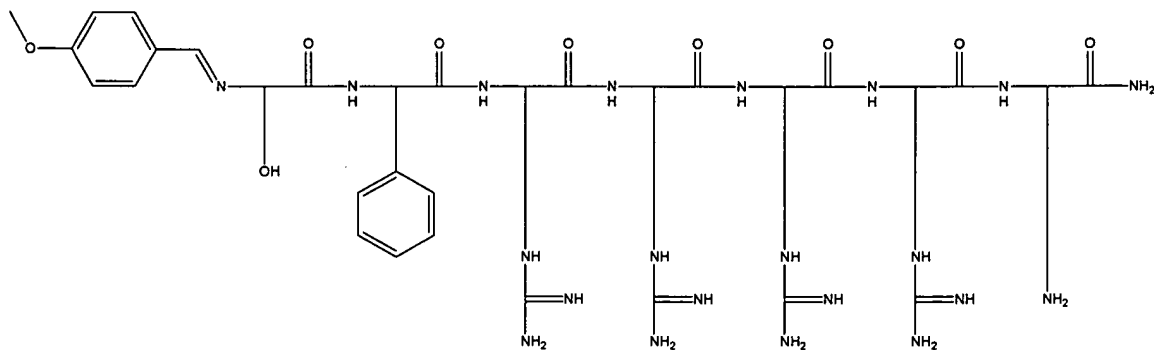


Compound 59

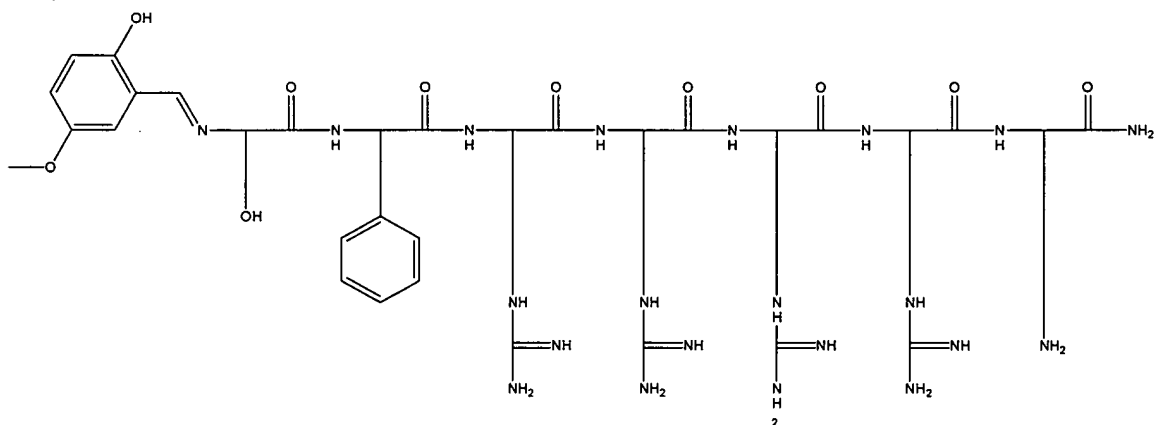


Compound 60

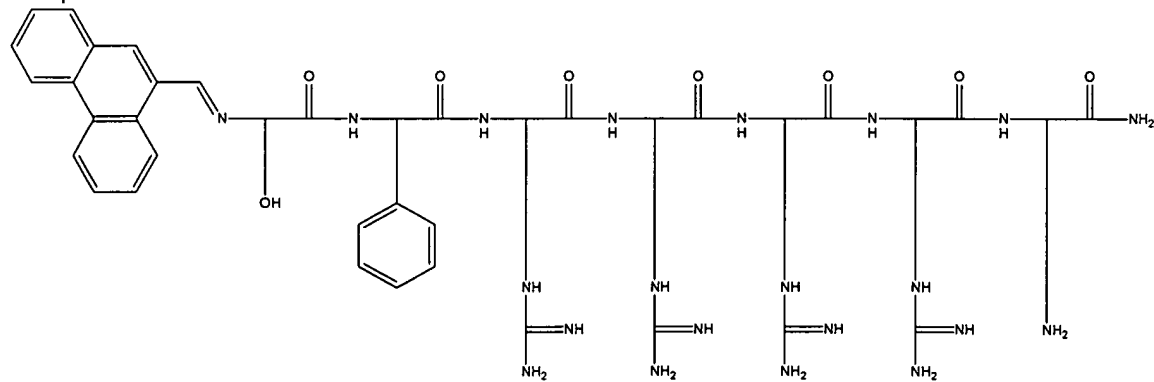
Applicant: David S. Lawrence
Serial No.: 10/755,086
Filed: January 9, 2004
page 31 of 190



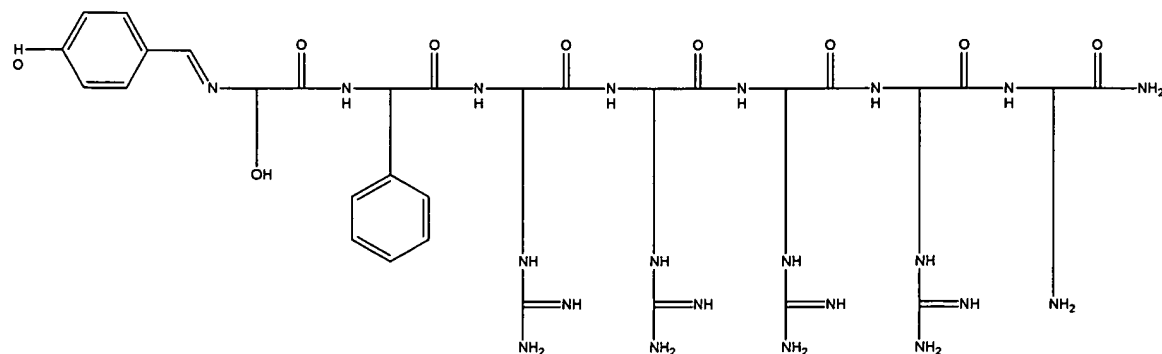
Compound 61



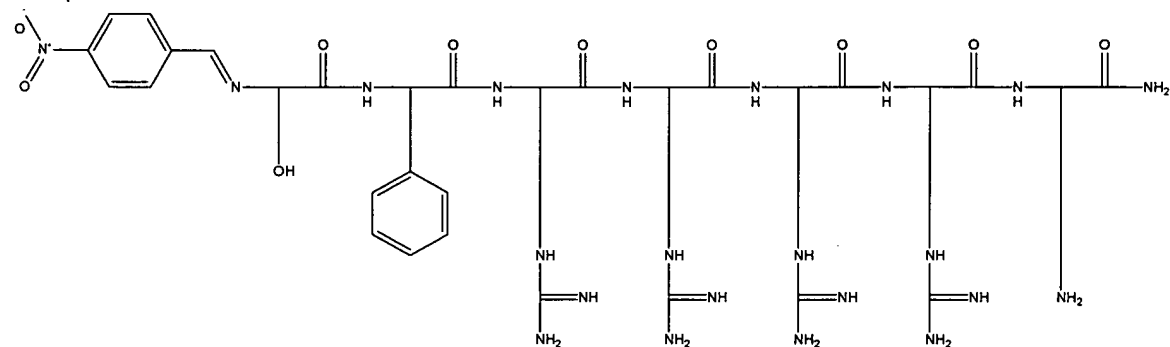
Compound 62



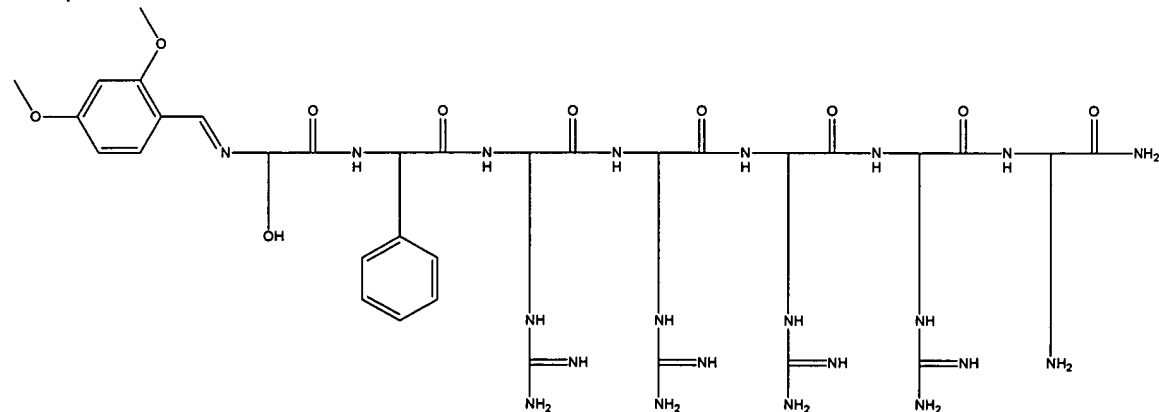
Compound 63



Compound 64

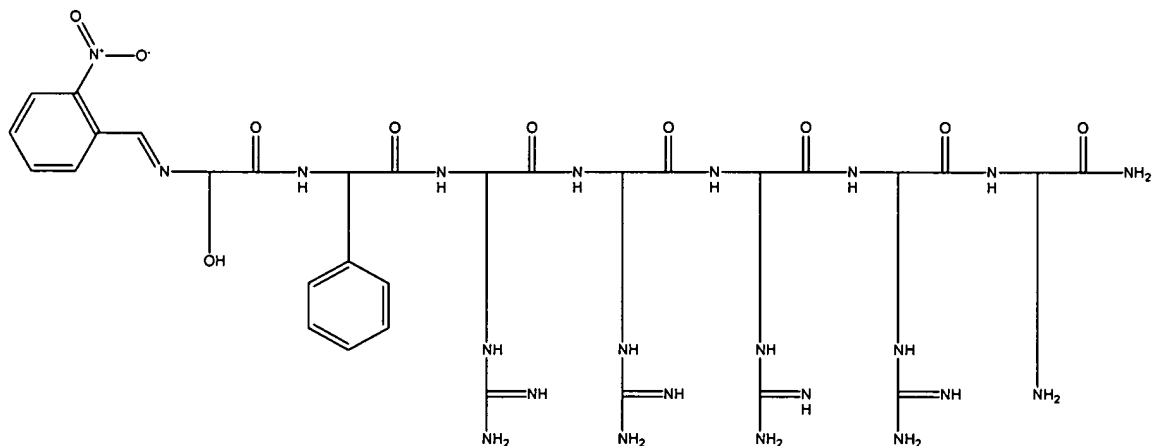


Compound 65

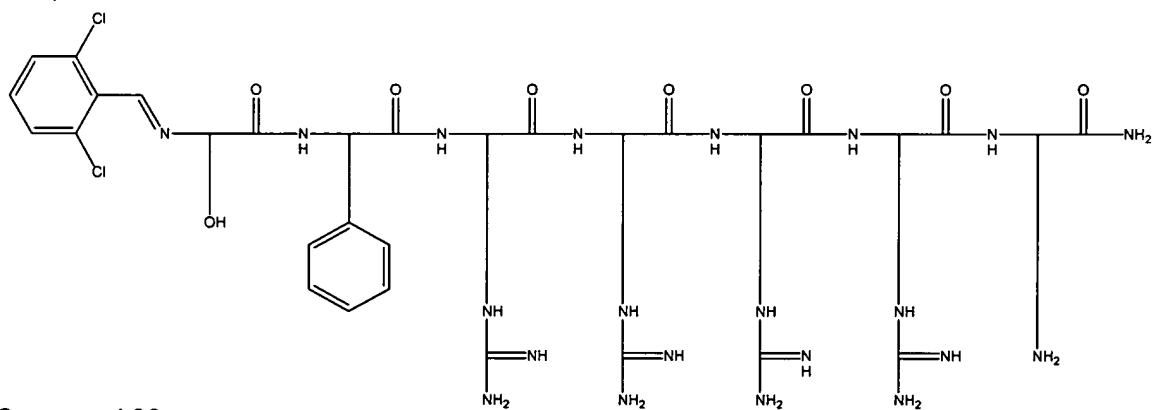


Compound 66

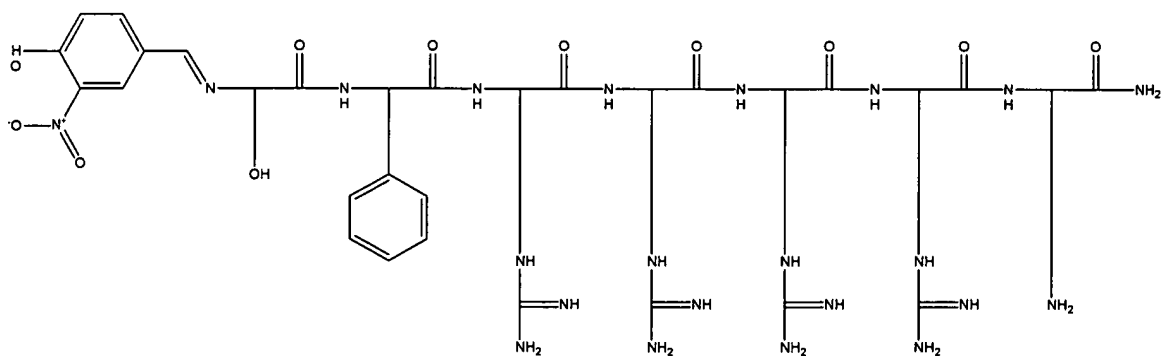
Applicant: David S. Lawrence
Serial No.: 10/755,086
Filed: January 9, 2004
page 33 of 190



Compound 67

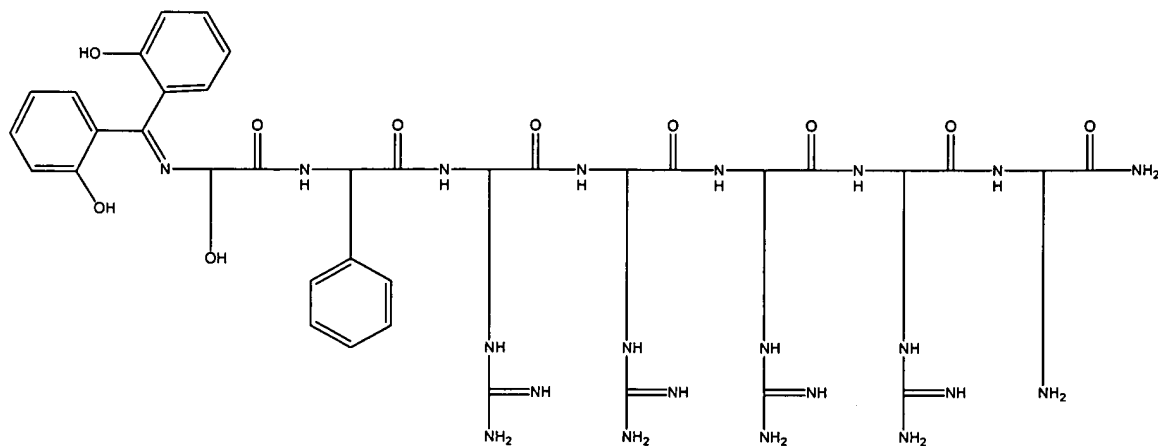


Compound 68

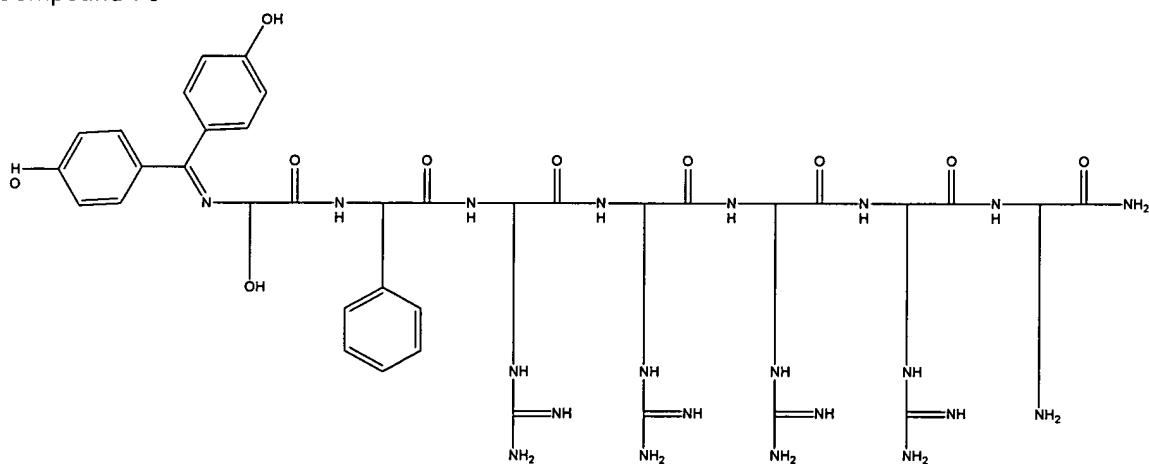


Compound 69

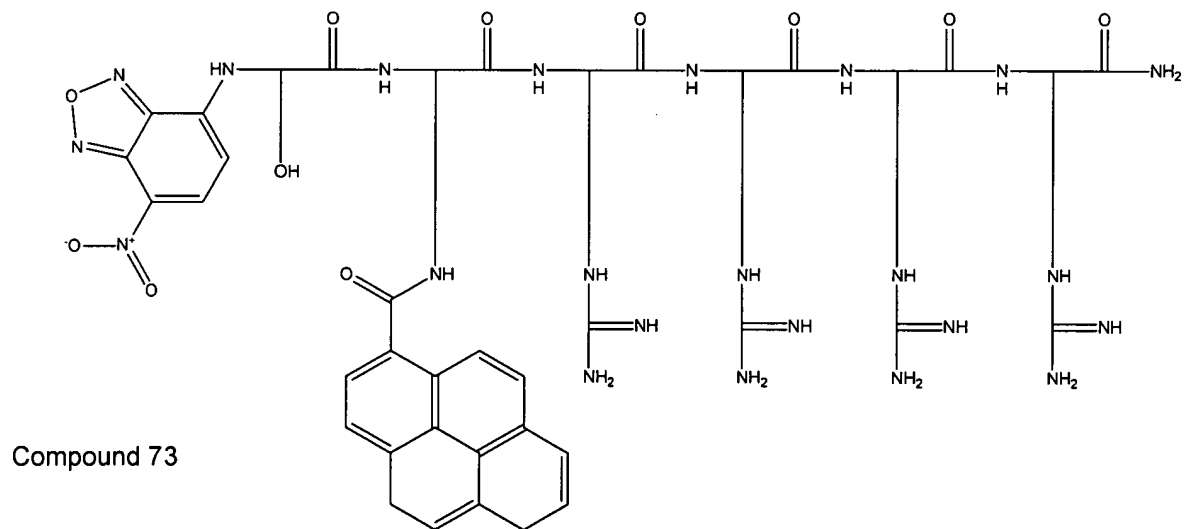
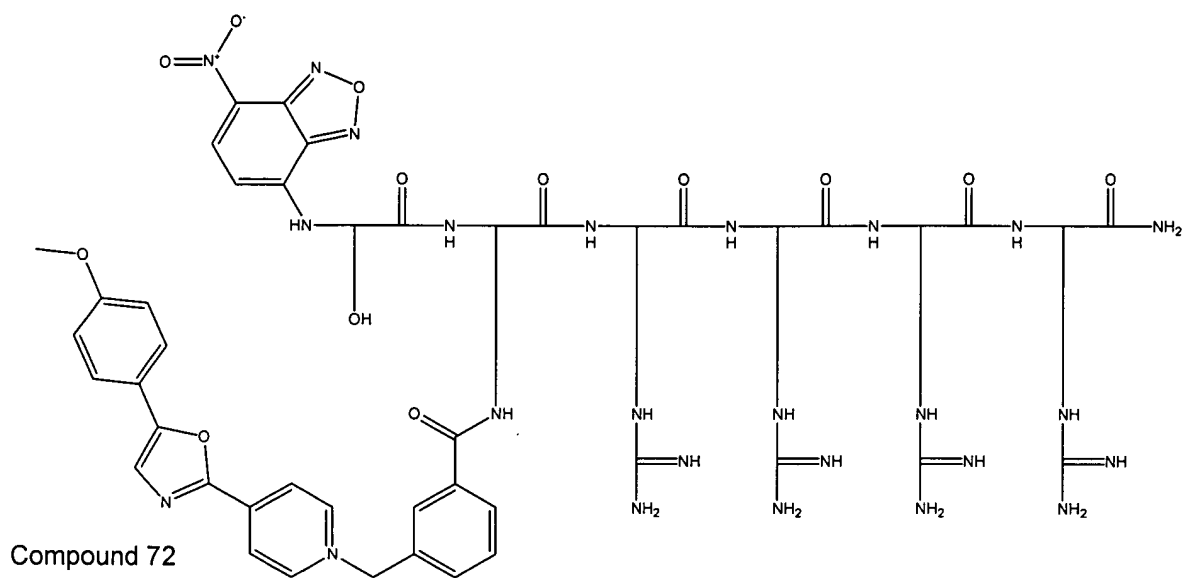
Applicant: David S. Lawrence
Serial No.: 10/755,086
Filed: January 9, 2004
page 34 of 190

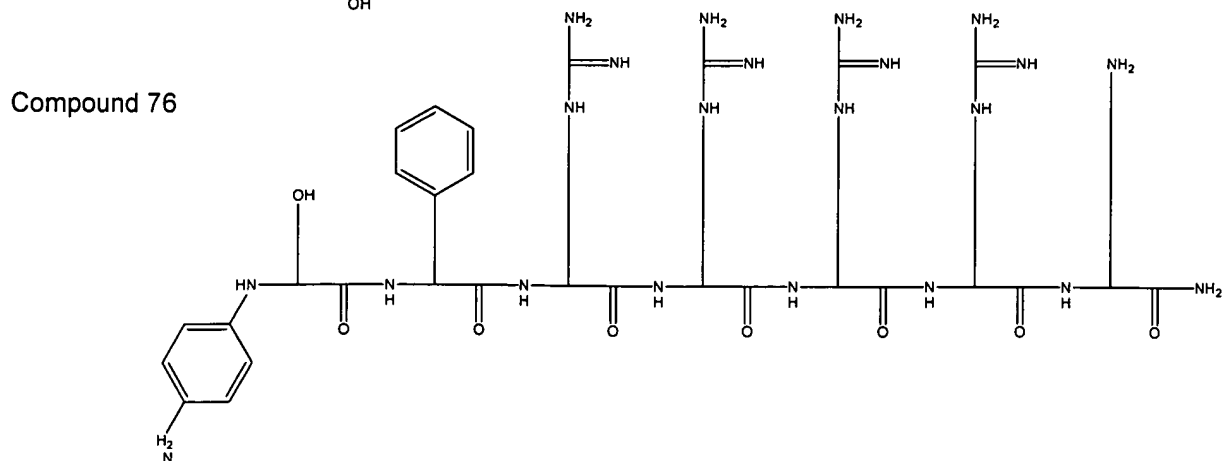
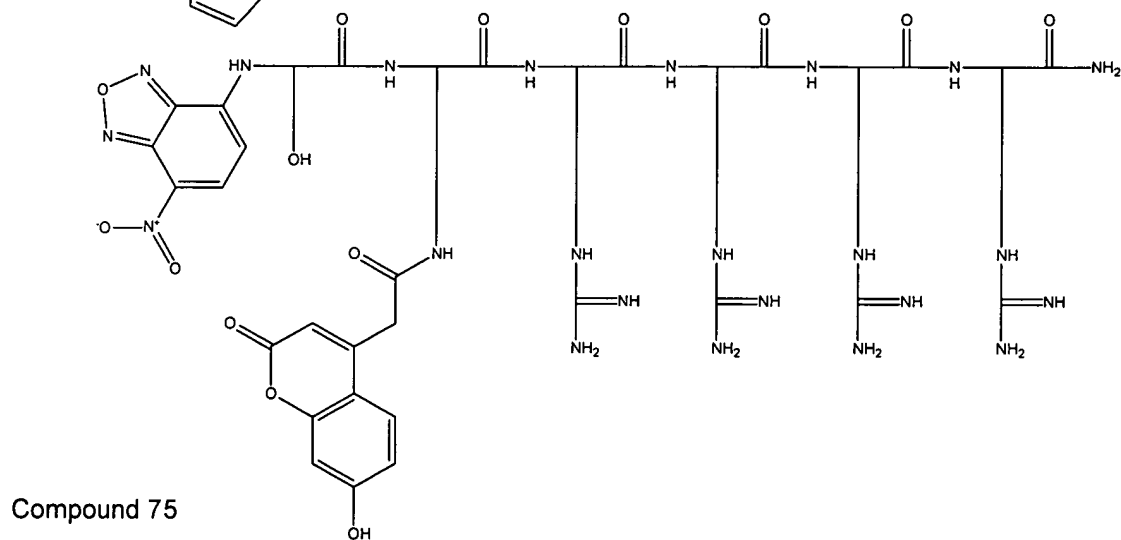
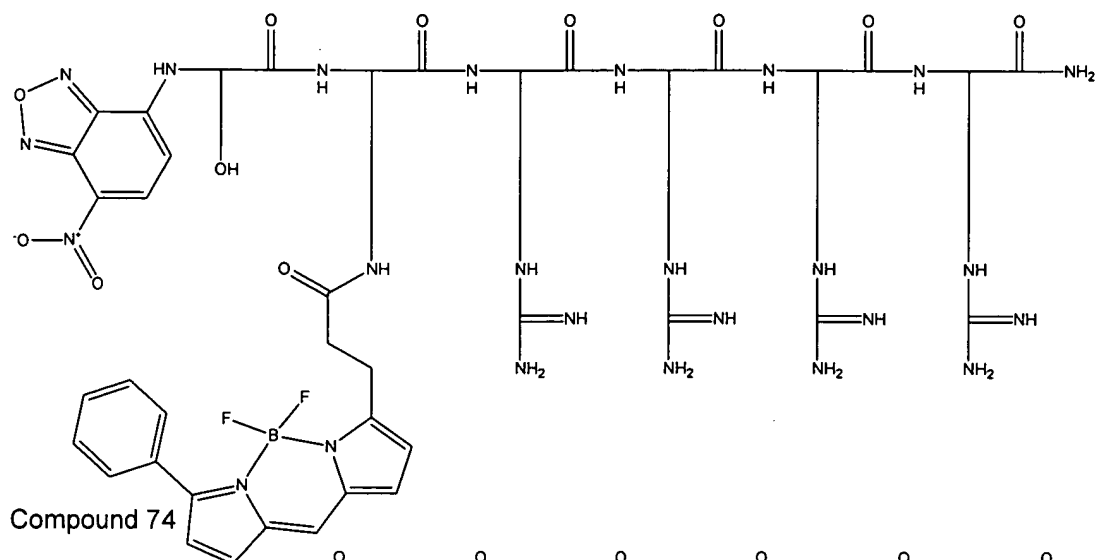


Compound 70

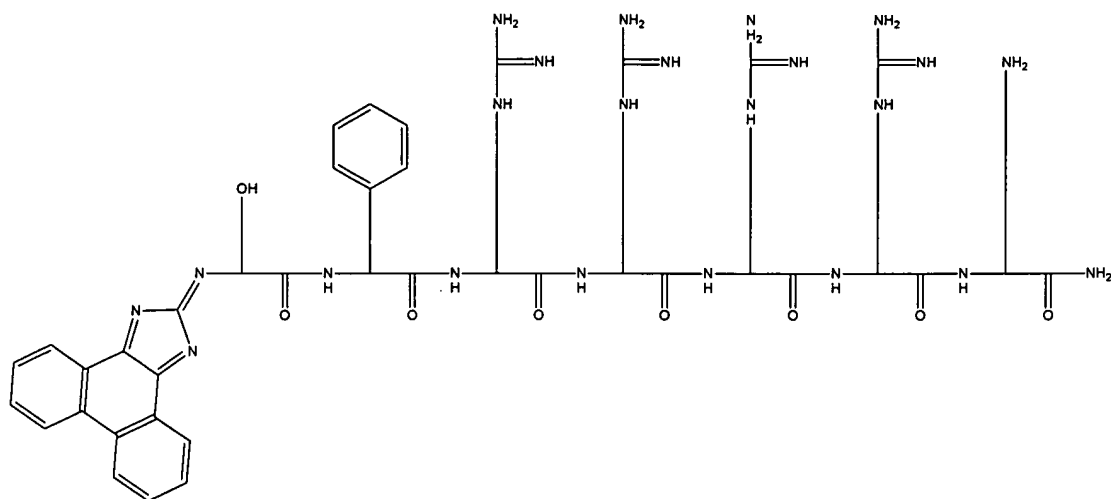


Compound 71

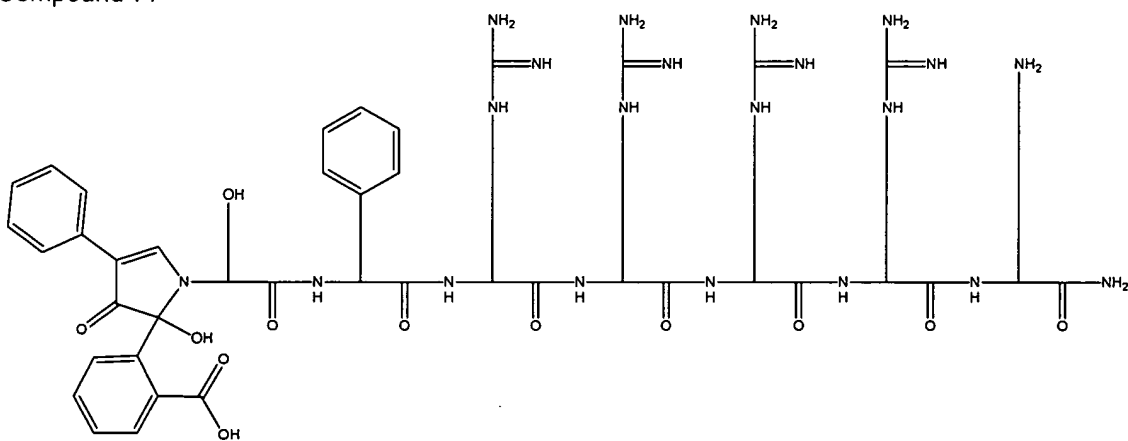




Applicant: David S. Lawrence
Serial No.: 10/755,086
Filed: January 9, 2004
page 37 of 190



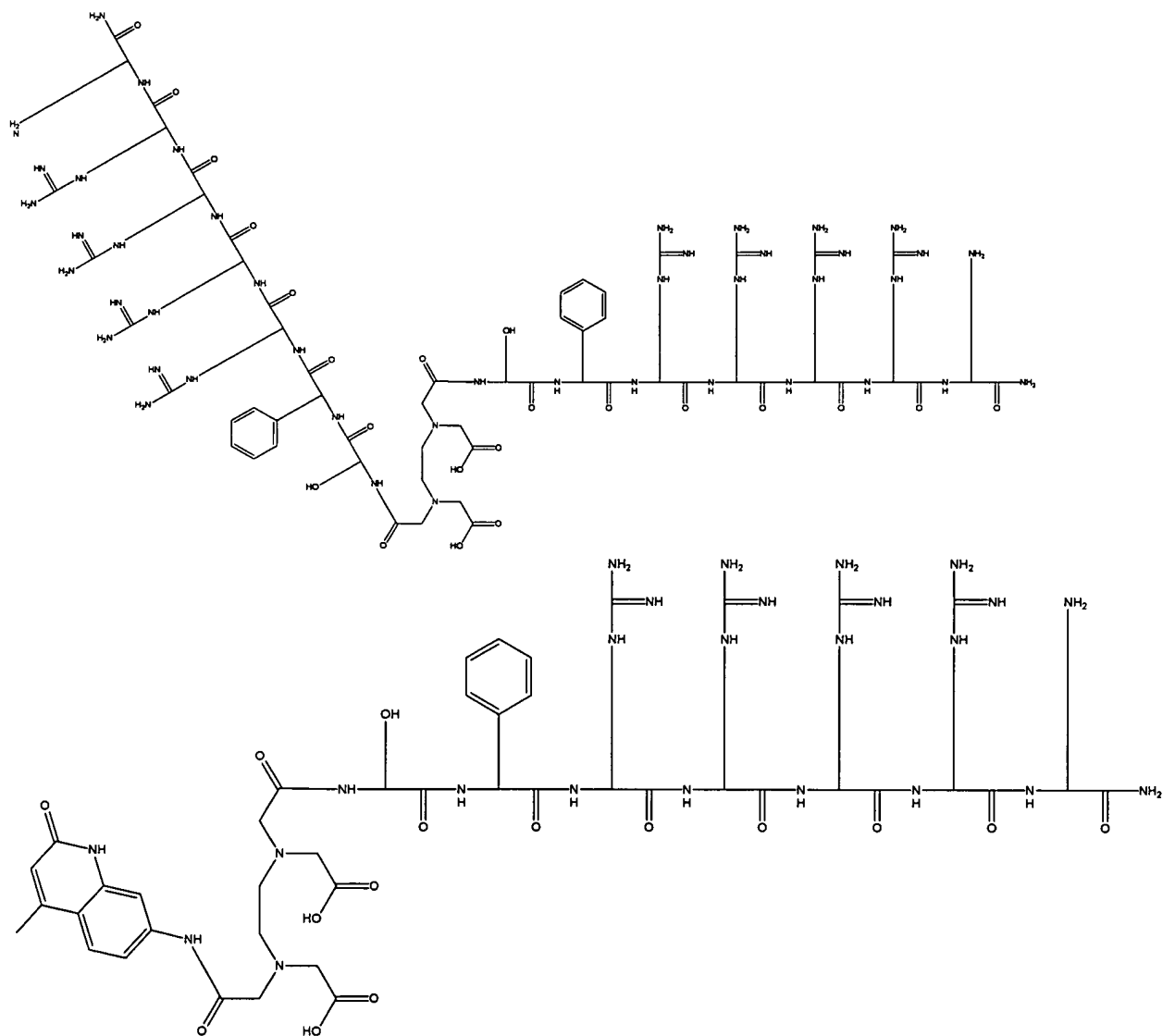
Compound 77



Compound 78

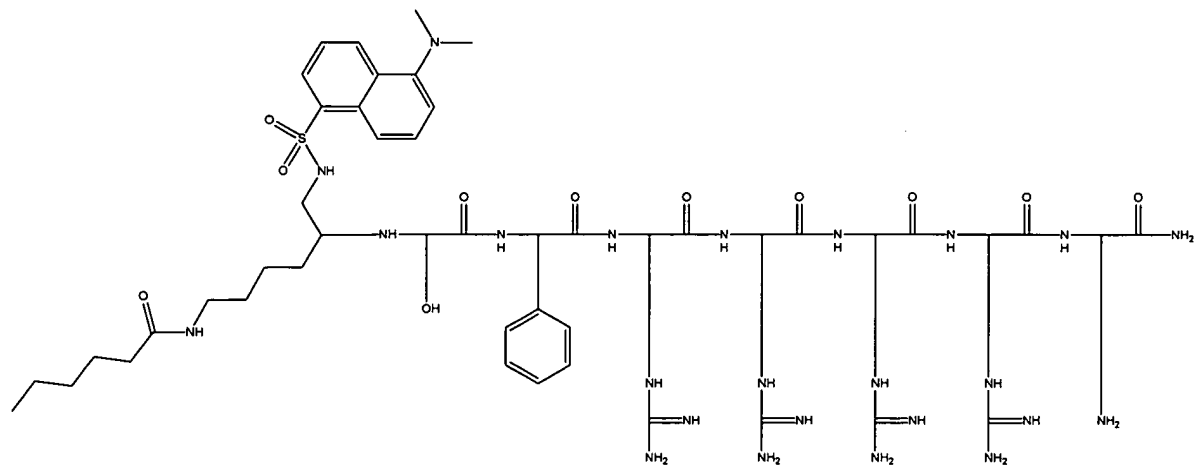
Applicant: David S. Lawrence
Serial No.: 10/755,086
Filed: January 9, 2004
page 38 of 190

Compound 79



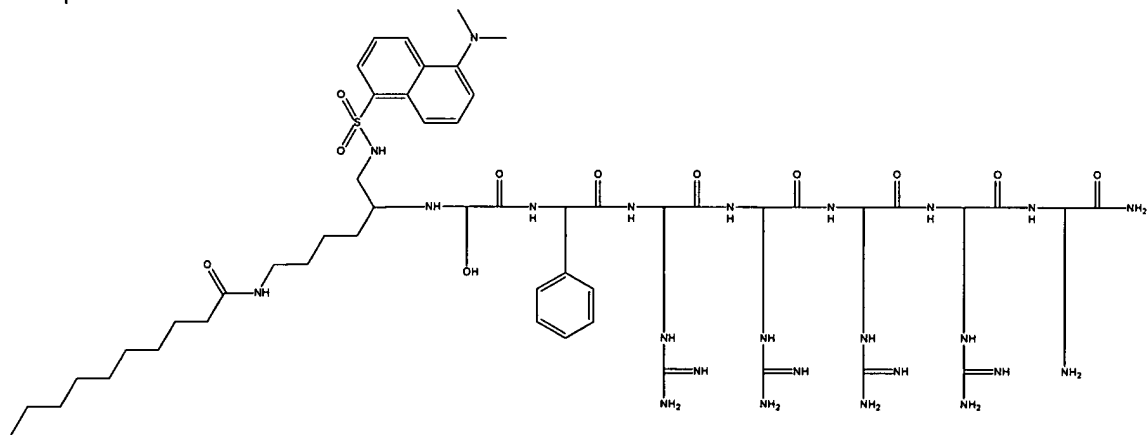
Compound 80

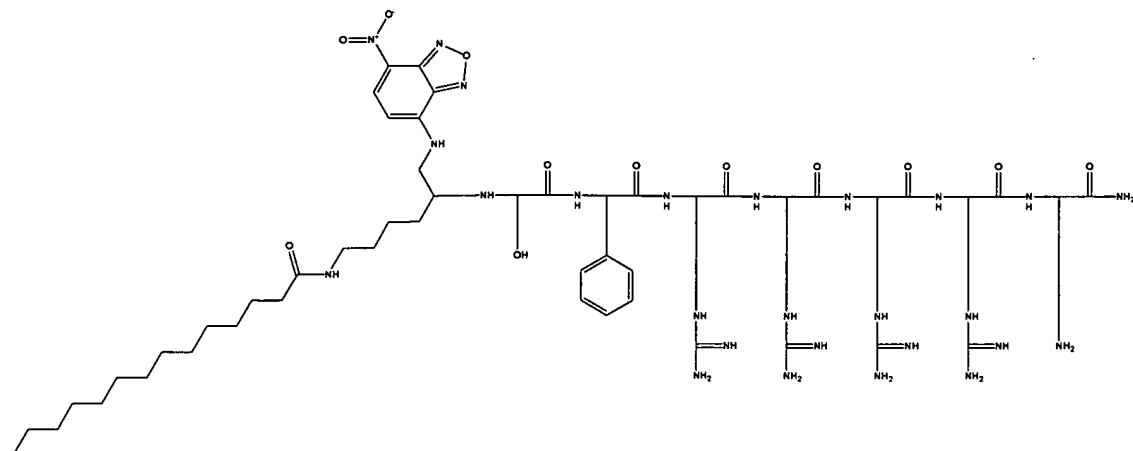
Applicant: David S. Lawrence
Serial No.: 10/755,086
Filed: January 9, 2004
page 39 of 190



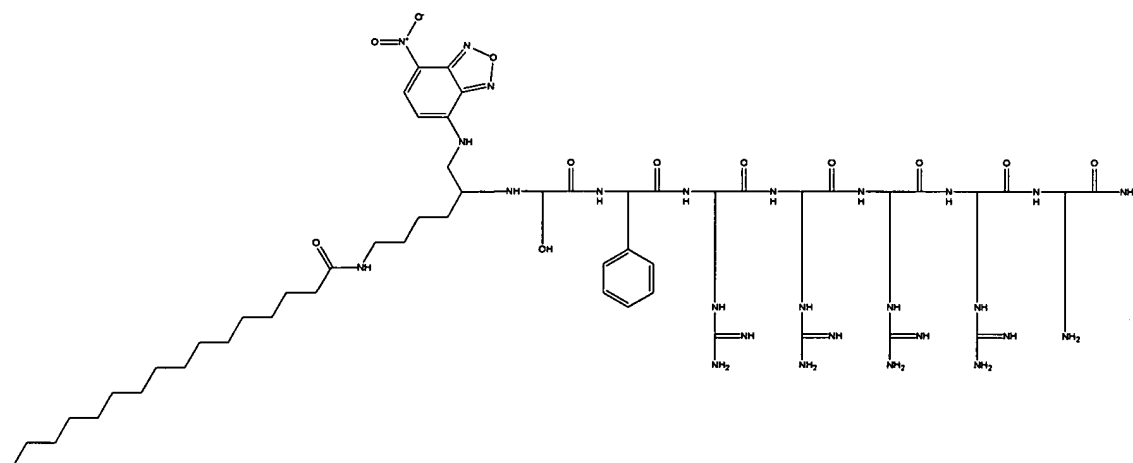
Compound 81

Compound 82

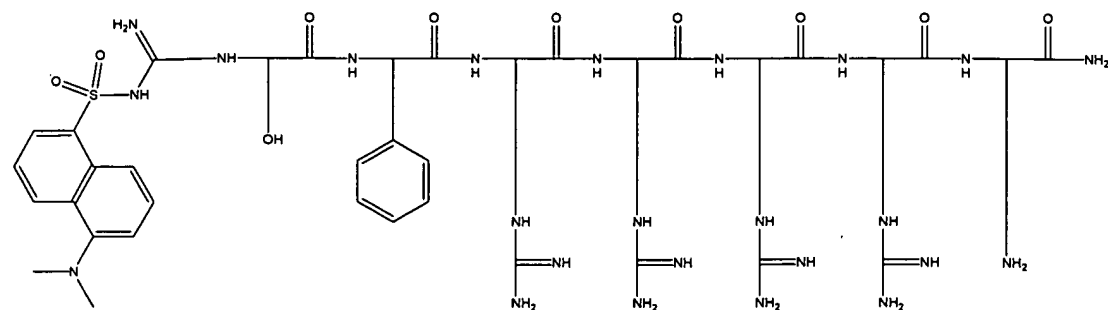




Compound 83

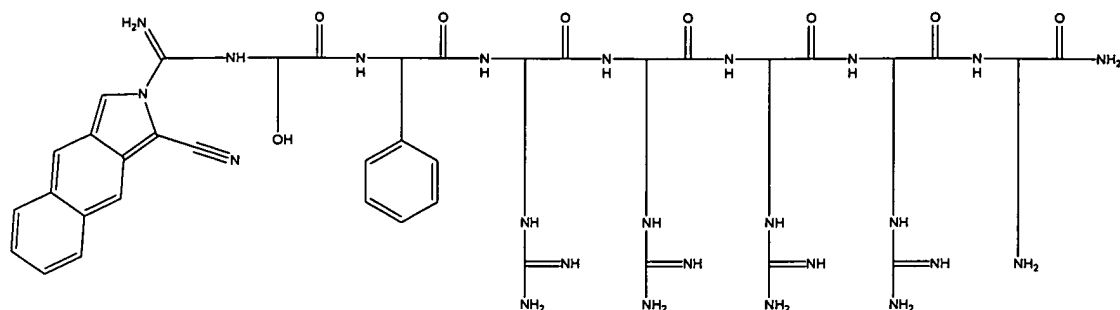


Compound 84



Compound 85

page 41 of 190

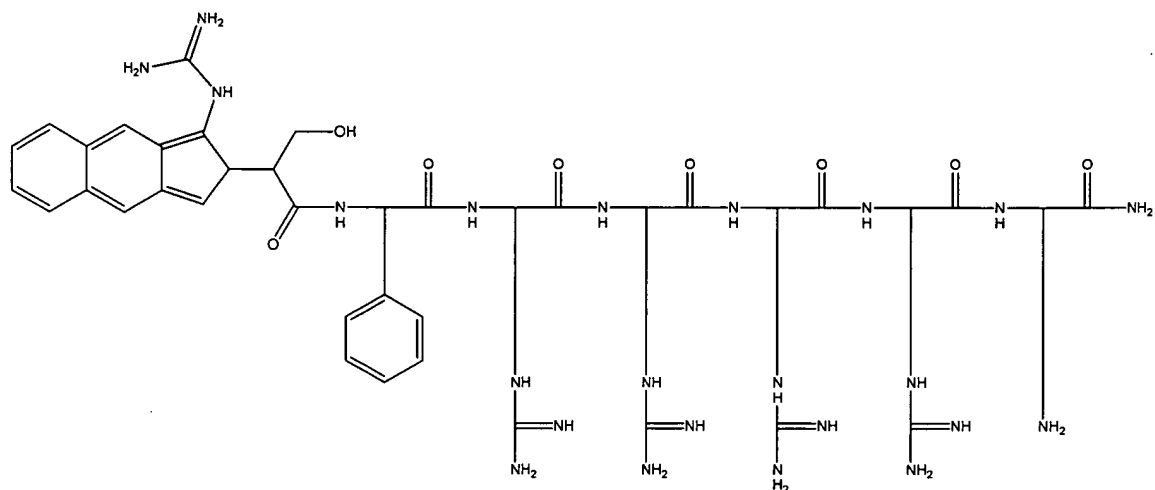
ONc1ccc2nc3c(c1)ncn3c2NC(=O)N[C@@H](O)C(=O)N[C@@H](c1ccccc1)C(=O)N[C@@H](NC=O)C(=O)N[C@@H](NC=O)C(=O)N[C@@H](NC=O)C(=O)N[C@@H](NC=O)C(=O)N[C@@H](NC=O)C(=O)N

Compound 3

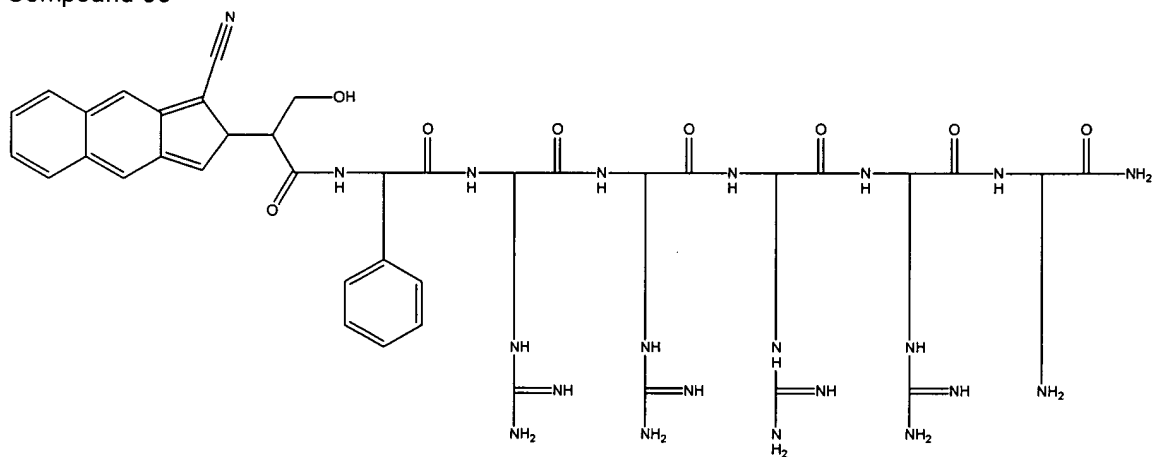
Nc1ccc2c(c1)c(c[nH]2)C(CO)C(=O)N[C@@H](Cc3ccccc3)C(=O)N[C@@H](C(=O)N)C(=O)N[C@@H](C(=O)N)C(=O)N[C@@H](C(=O)N)C(=O)N[C@@H](C(=O)N)C(=O)N[C@@H](C(=O)N)C(=O)N

418197.1

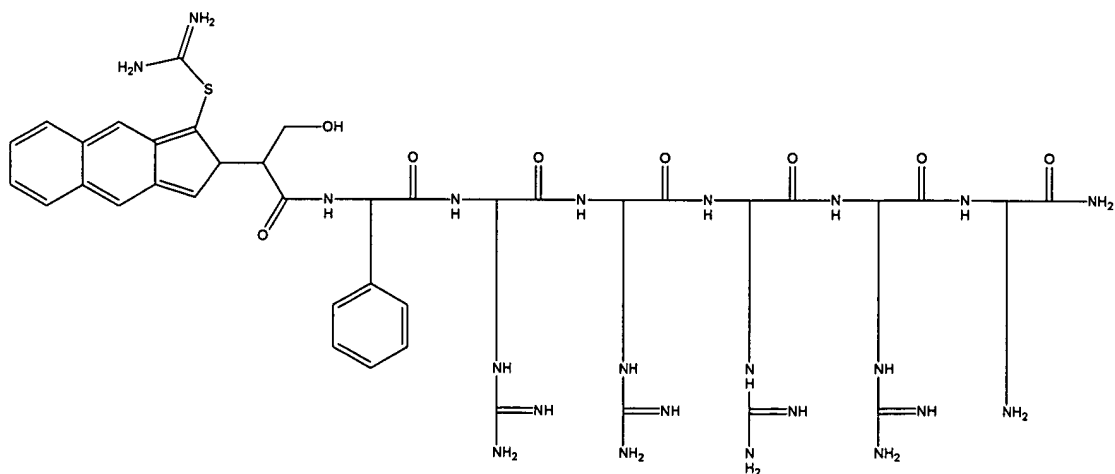
Applicant: David S. Lawrence
Serial No.: 10/755,086
Filed: January 9, 2004
page 42 of 190



Compound 89

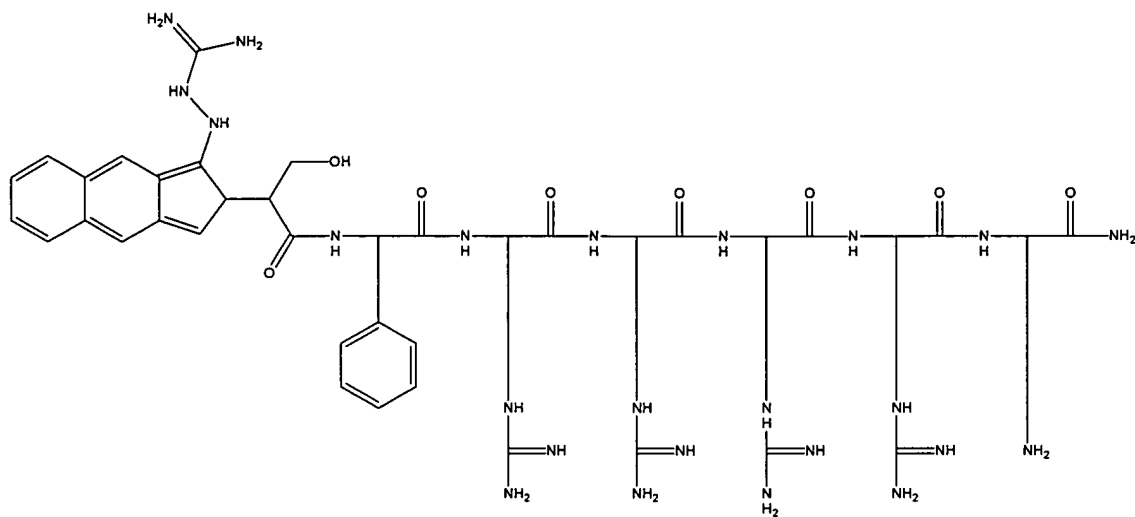


Compound 90

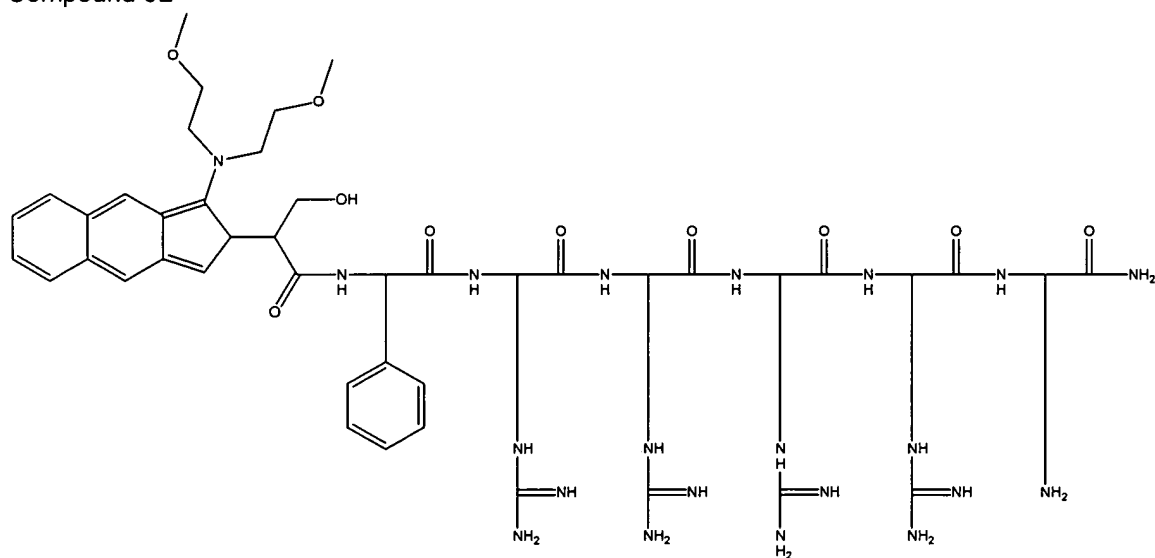


Compound 91

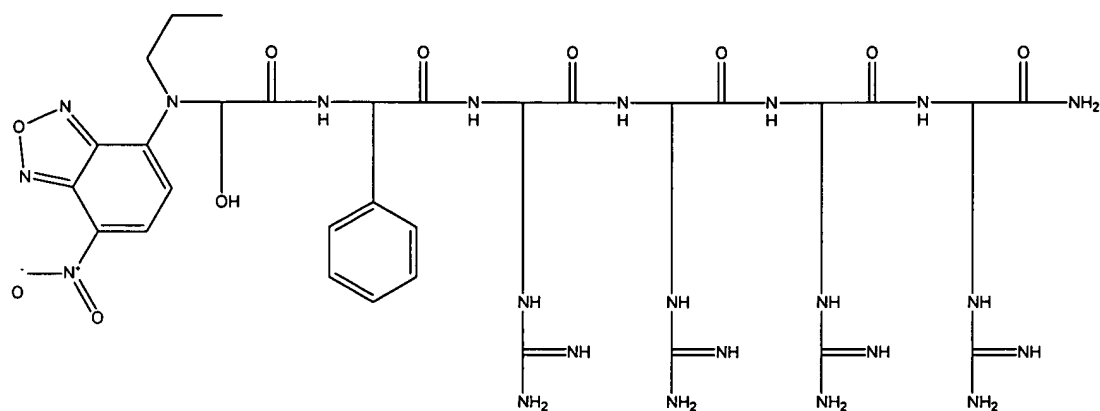
Applicant: David S. Lawrence
Serial No.: 10/755,086
Filed: January 9, 2004
page 43 of 190



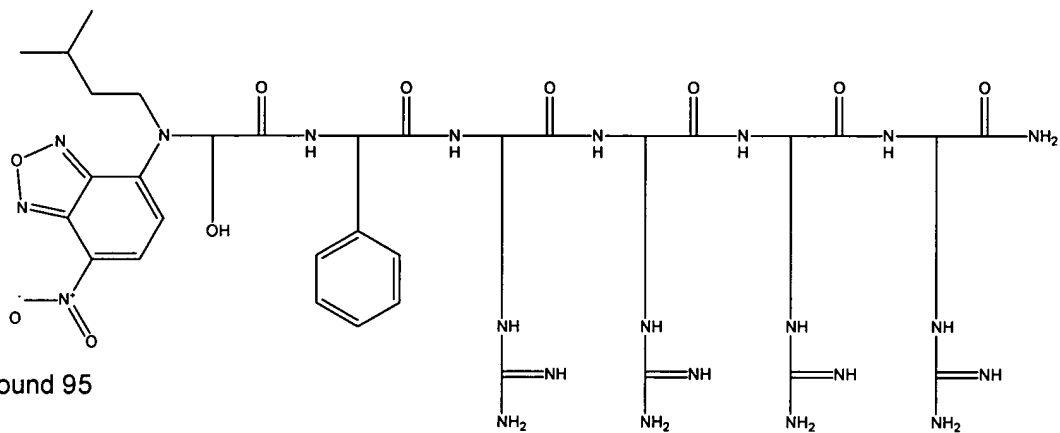
Compound 92



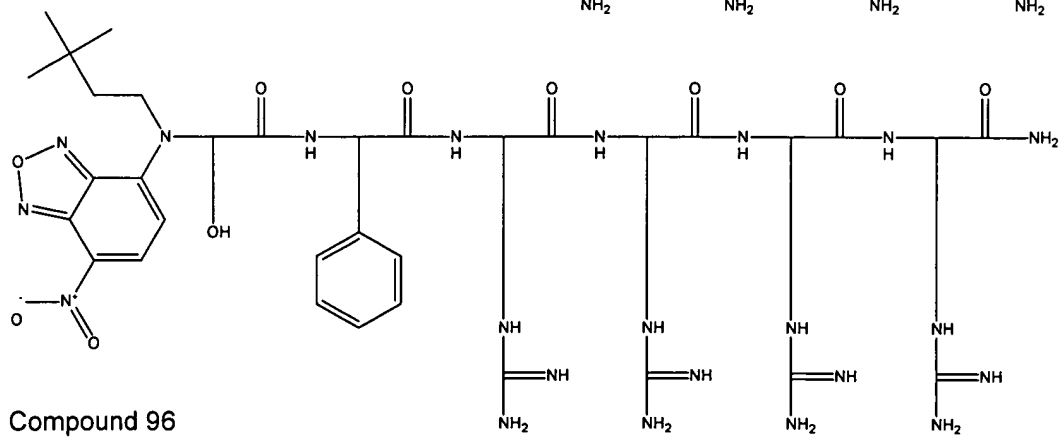
Compound 93



Compound 94

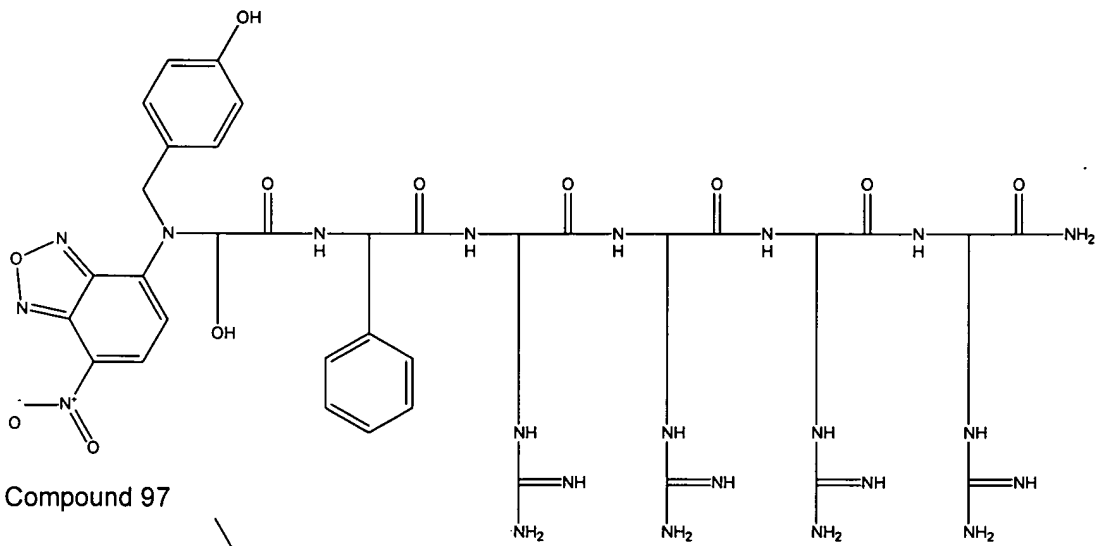


Compound 95

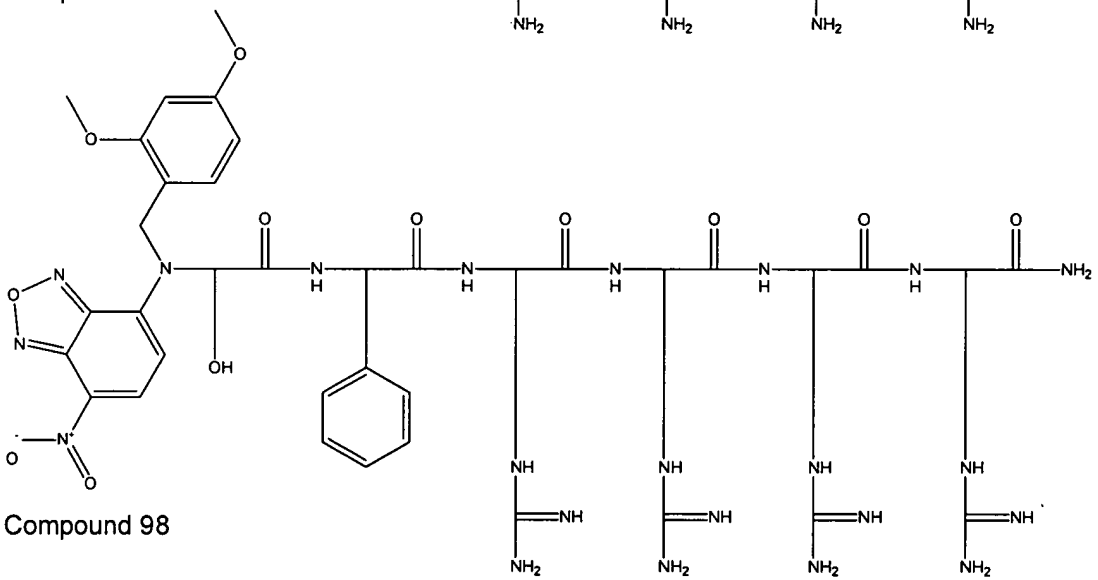


Compound 96

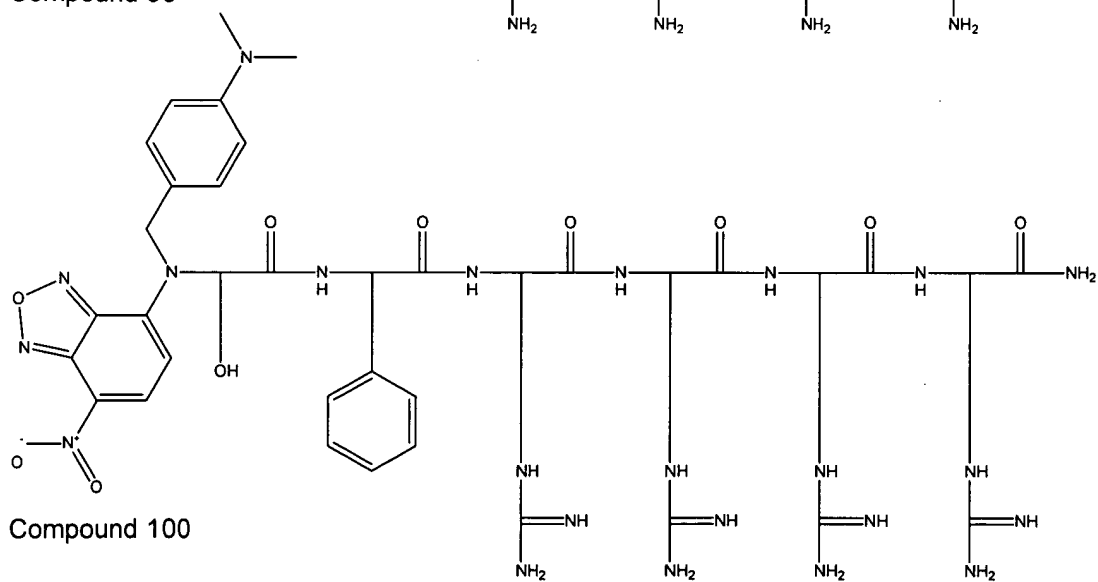
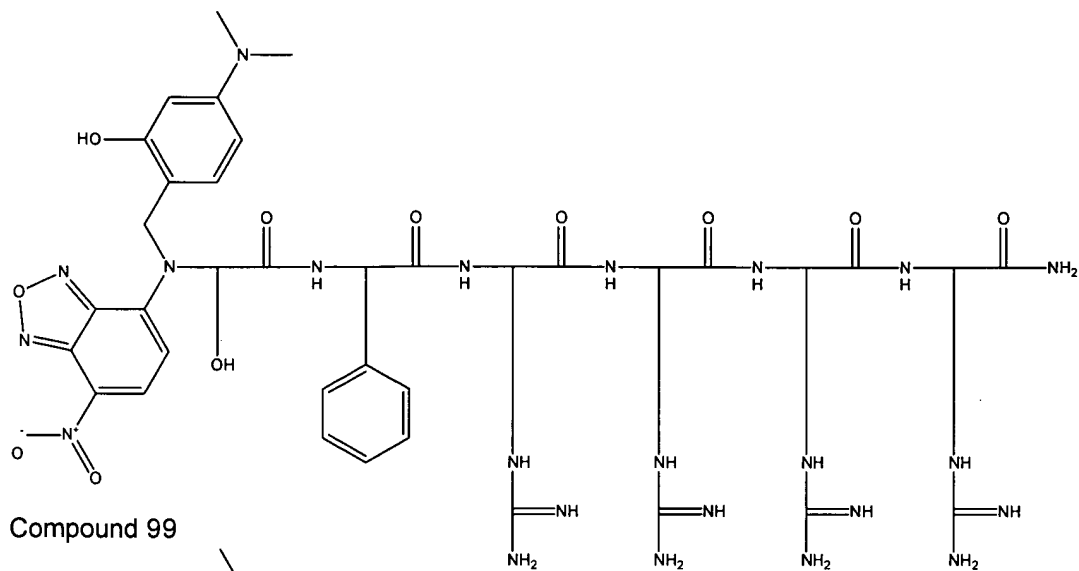
page 45 of 190

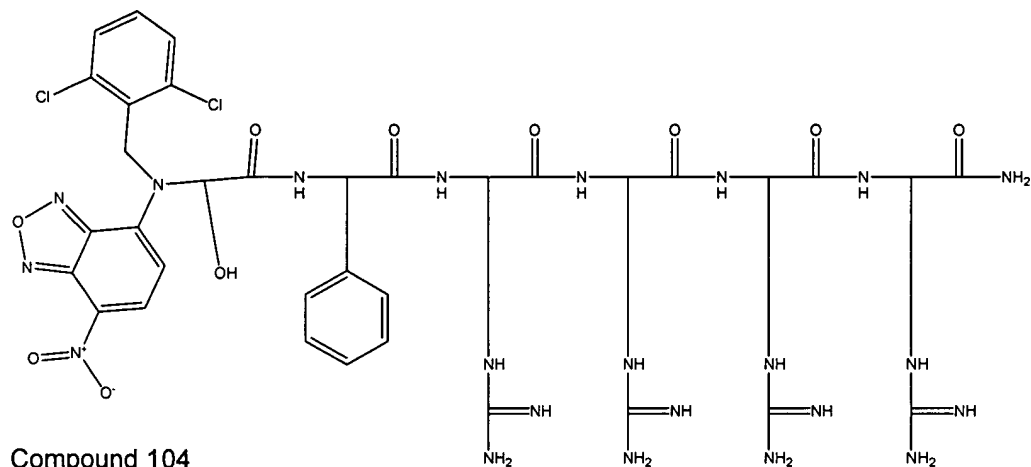


Compound 97

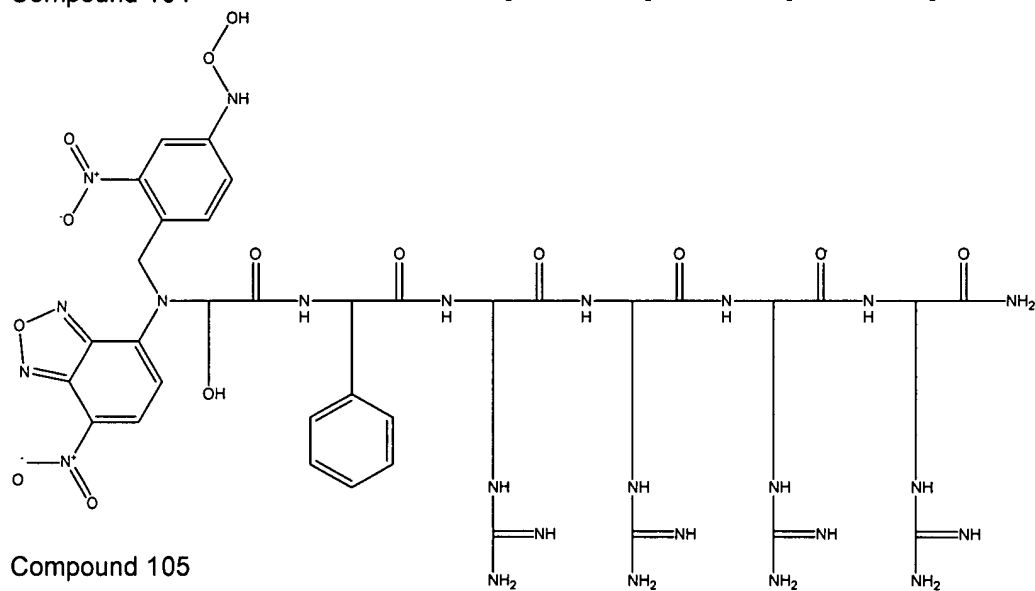


Compound 98





Compound 104



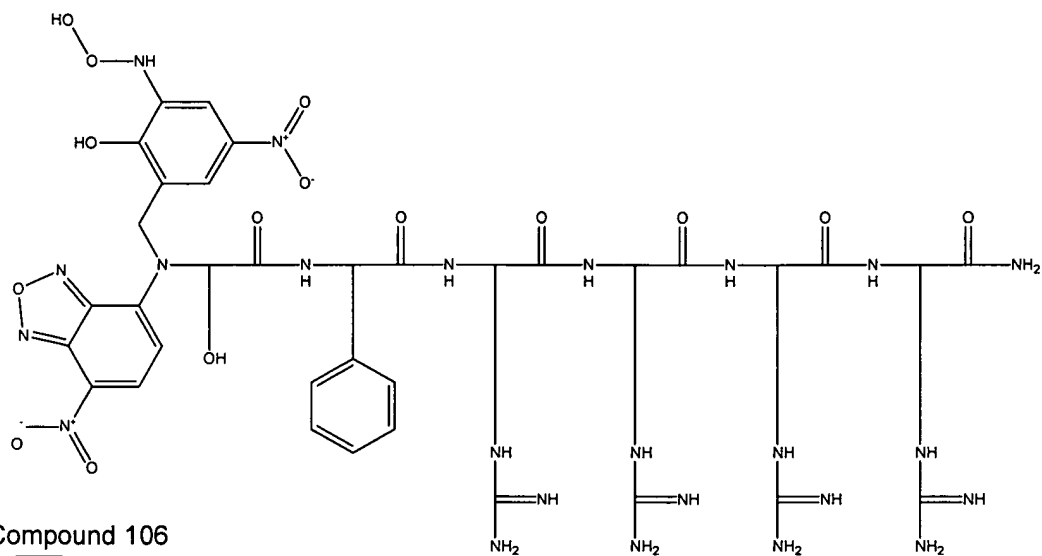
Compound 105

Applicant: David S. Lawrence

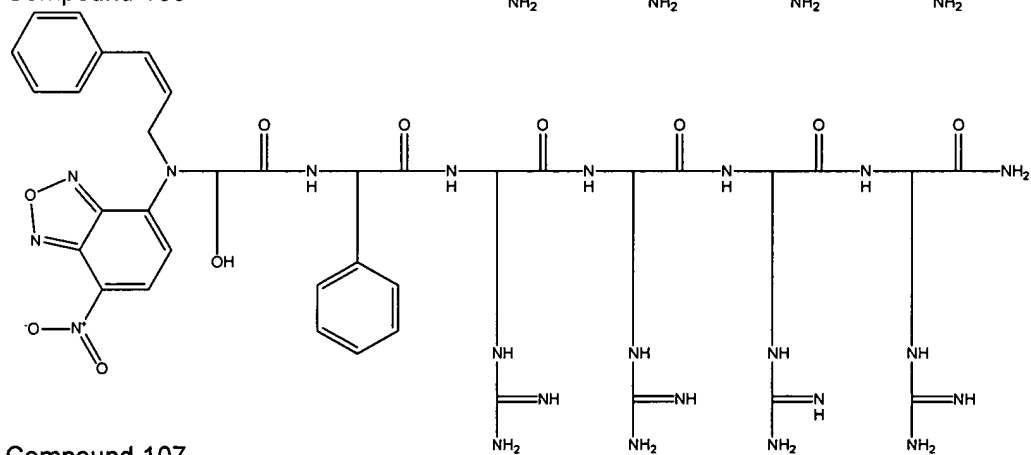
Serial No.: 10/755,086

Filed: January 9, 2004

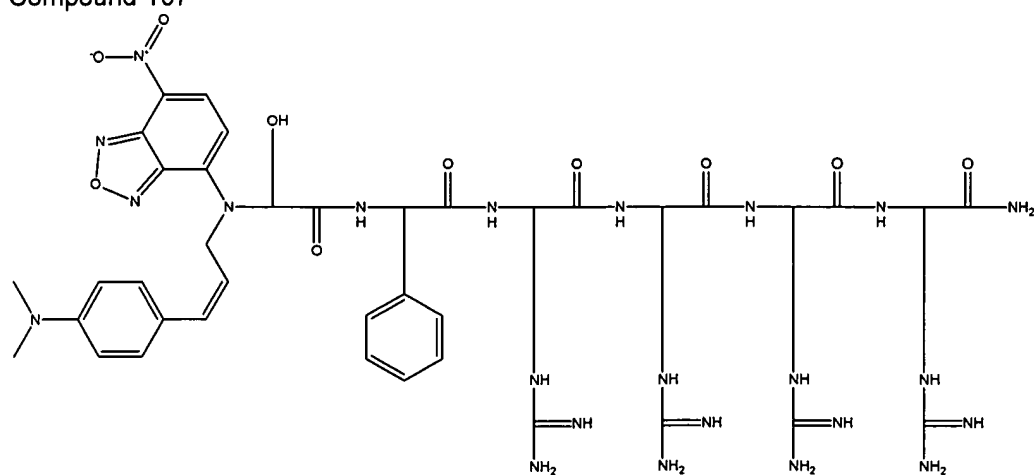
page 49 of 190



Compound 106

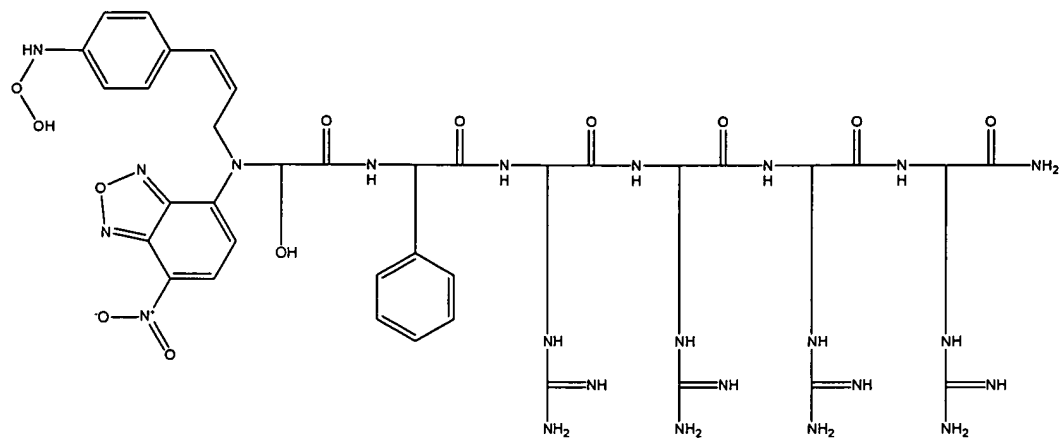


Compound 107

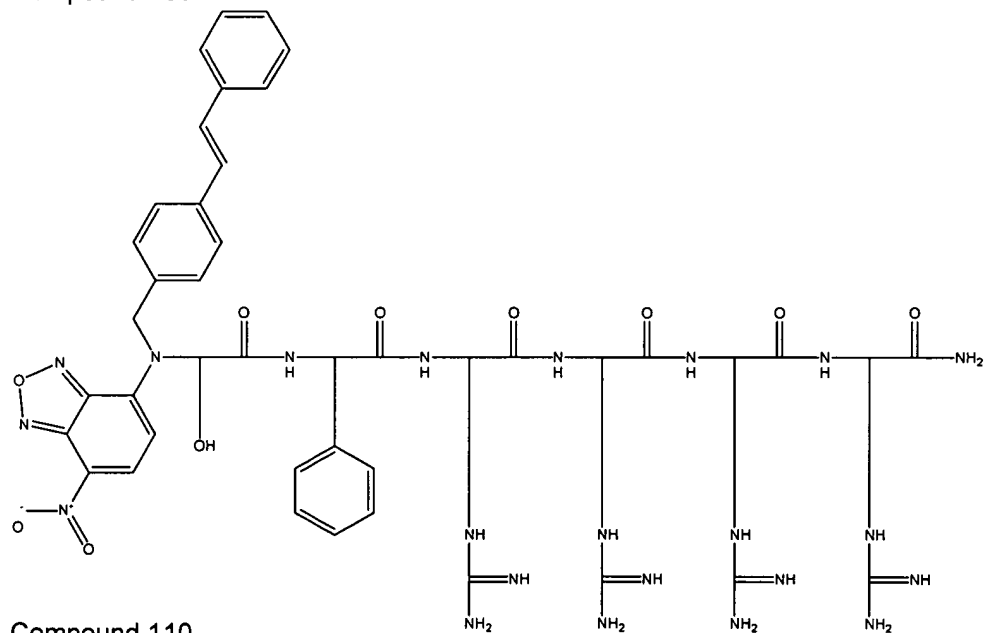


Compound 108

Applicant: David S. Lawrence
Serial No.: 10/755,086
Filed: January 9, 2004
page 50 of 190



Compound 109



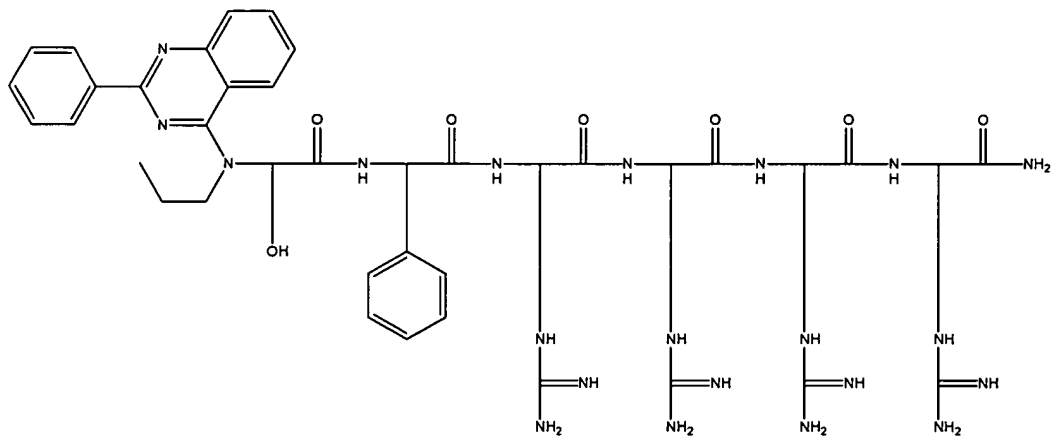
Compound 110

page 51 of 190

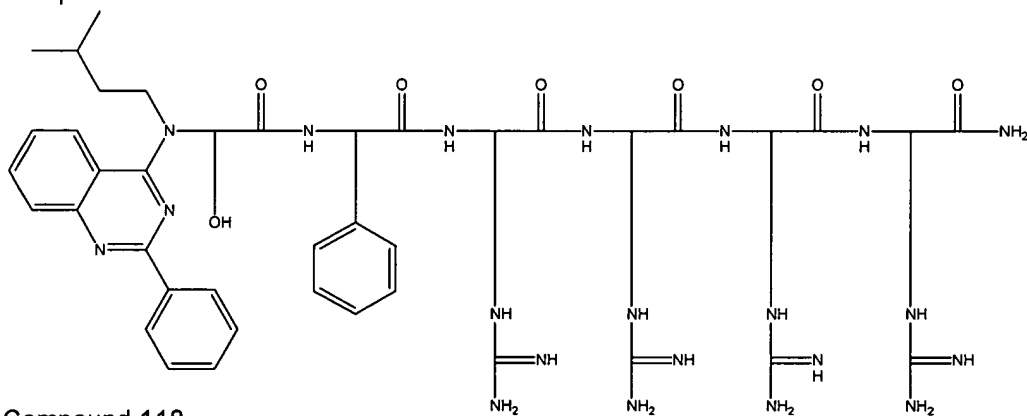


page 52 of 190

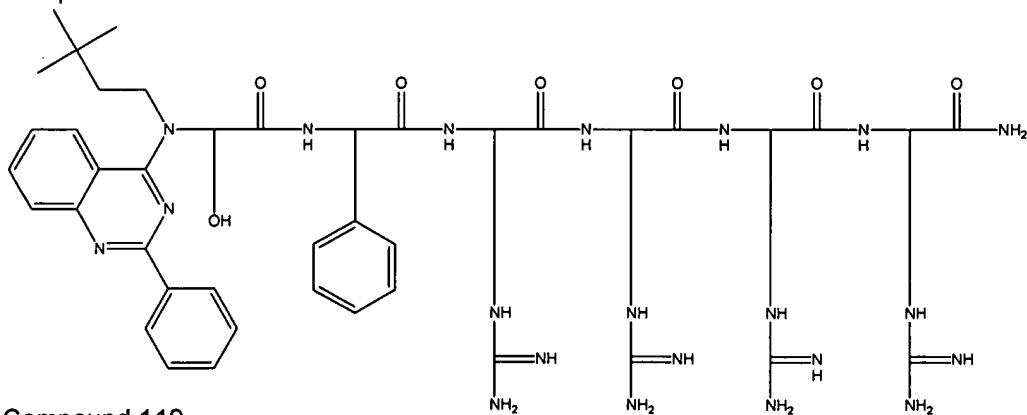




Compound 117

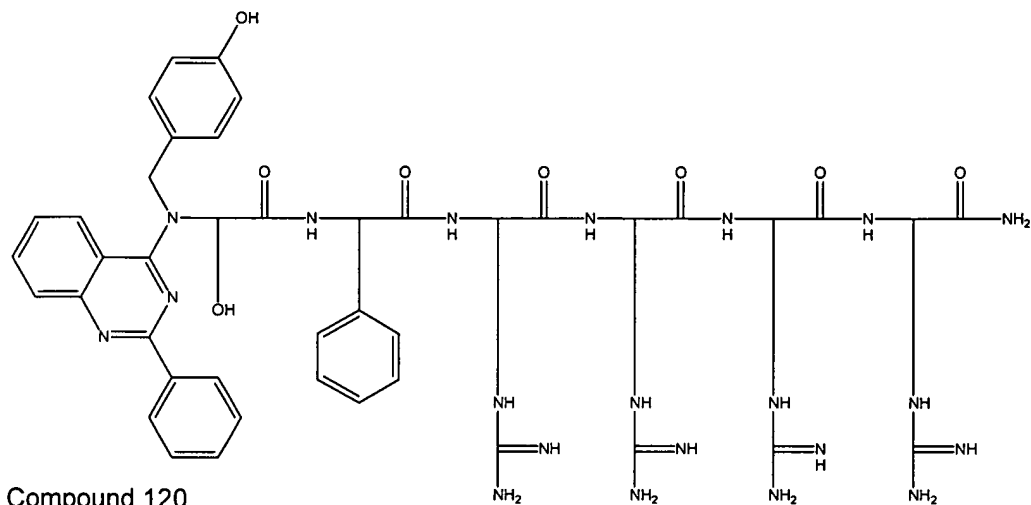


Compound 118

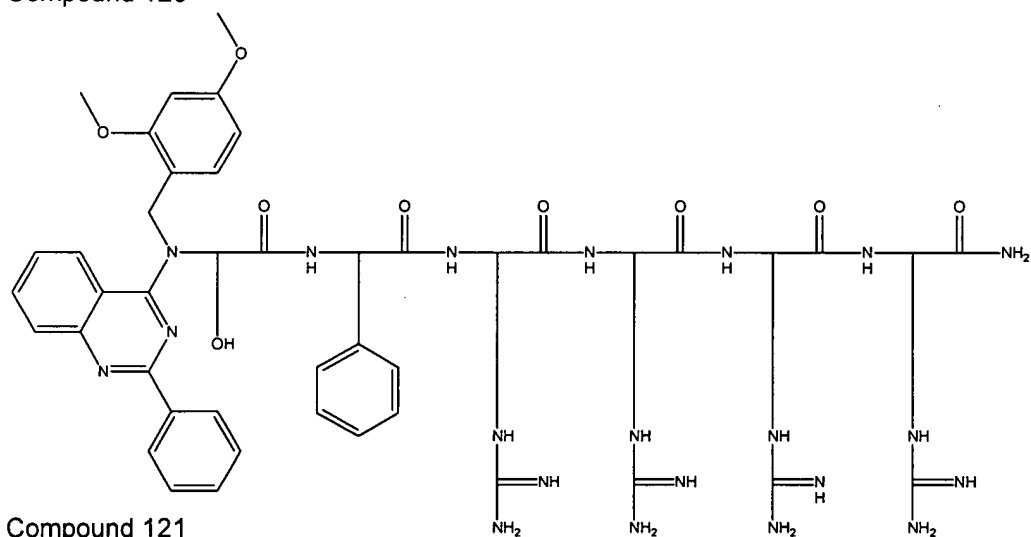


Compound 119

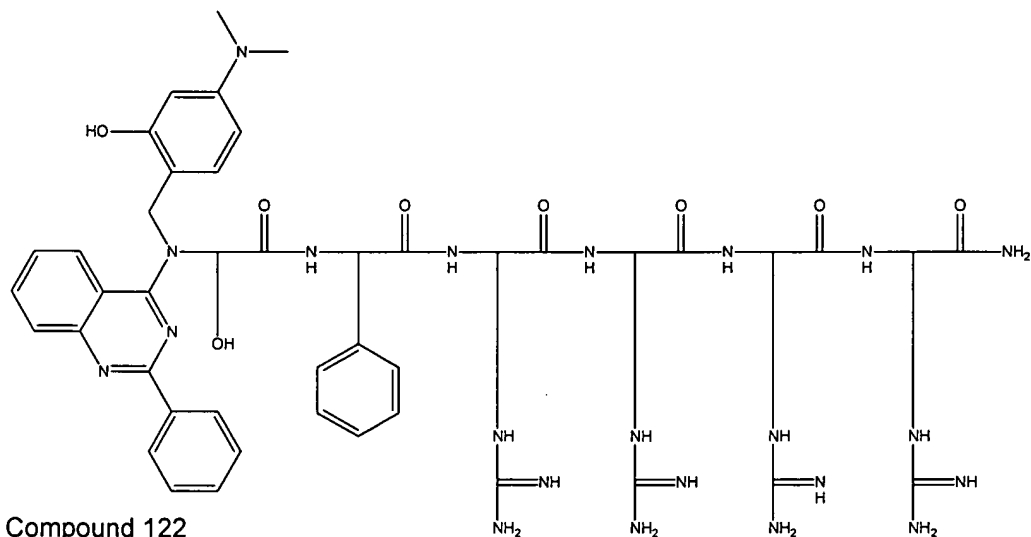
Applicant: David S. Lawrence
Serial No.: 10/755,086
Filed: January 9, 2004
page 54 of 190



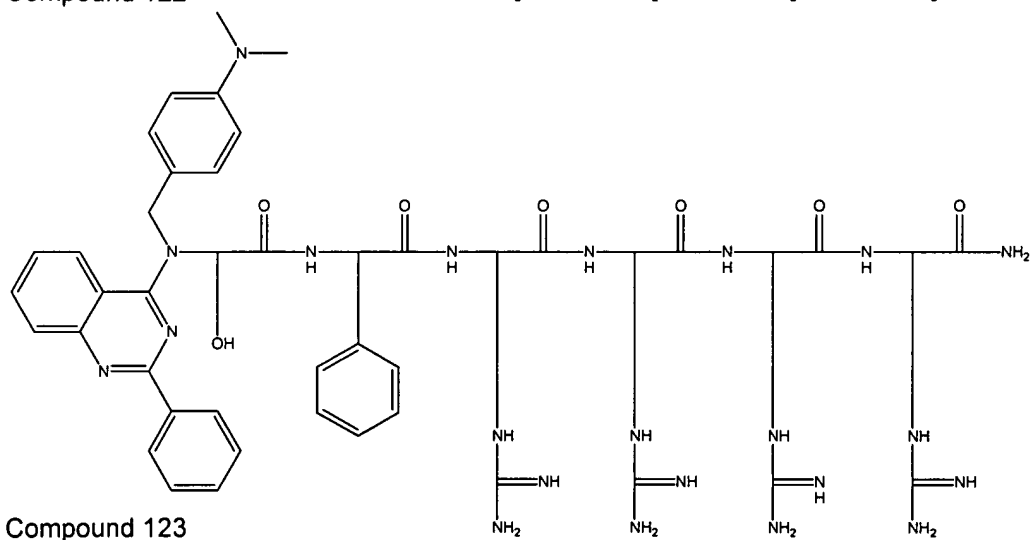
Compound 120



Compound 121



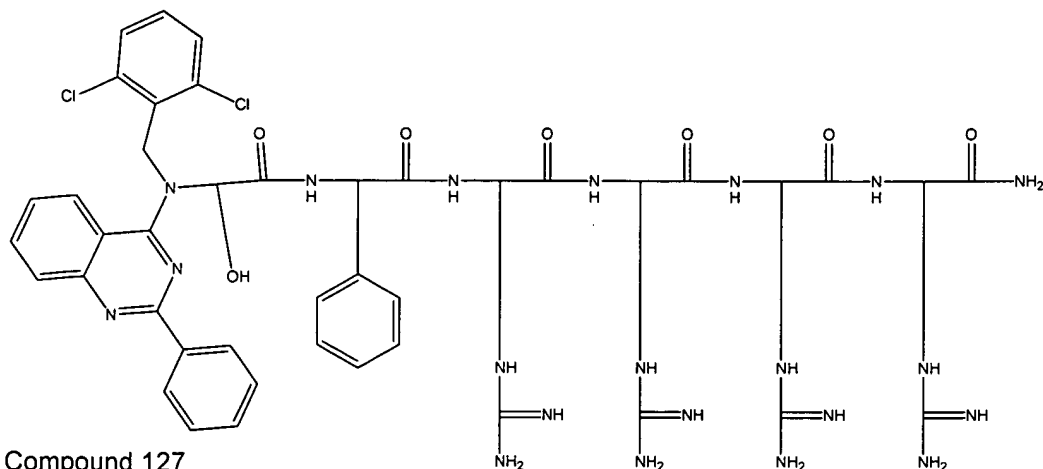
Compound 122



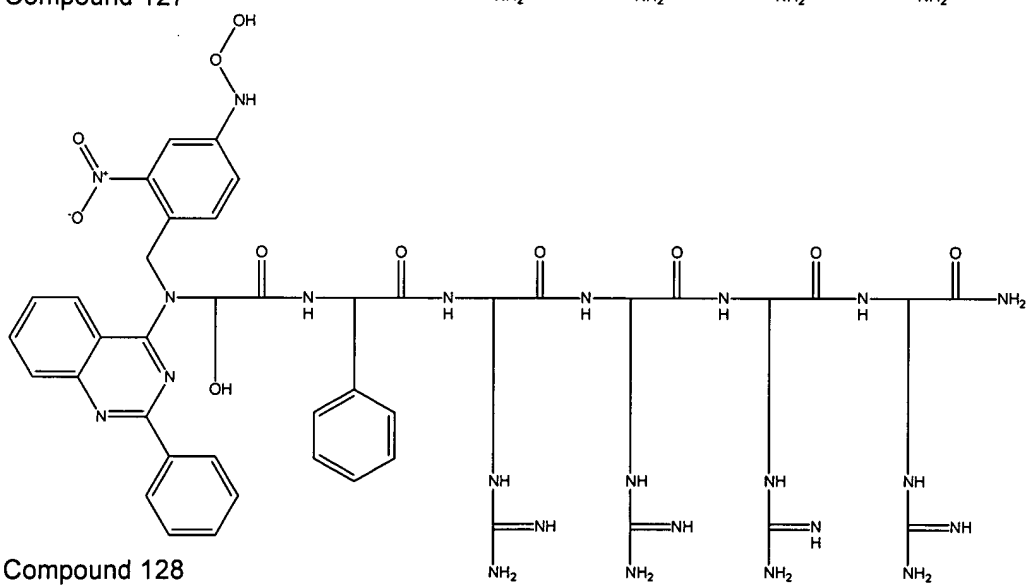
Compound 123

page 56 of 190

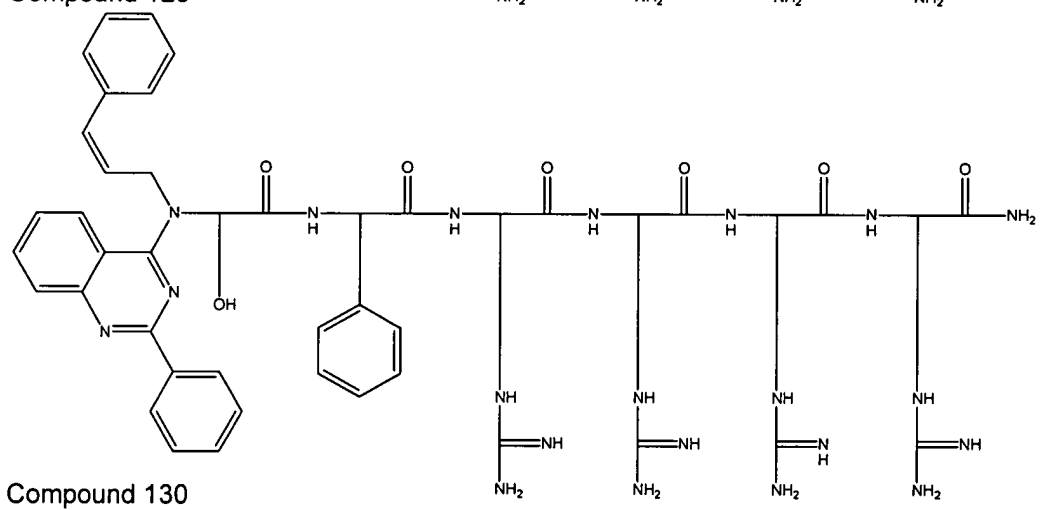
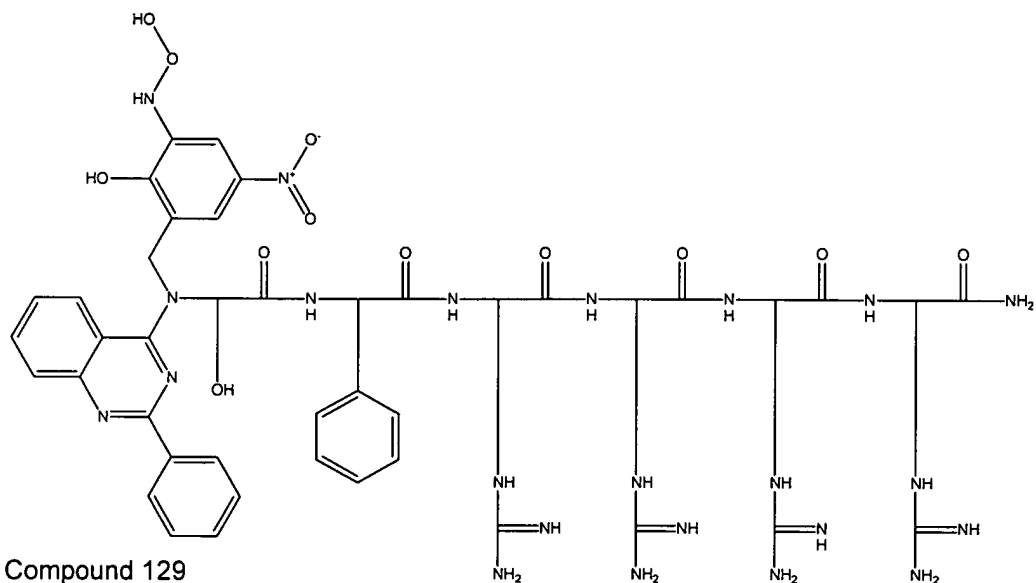




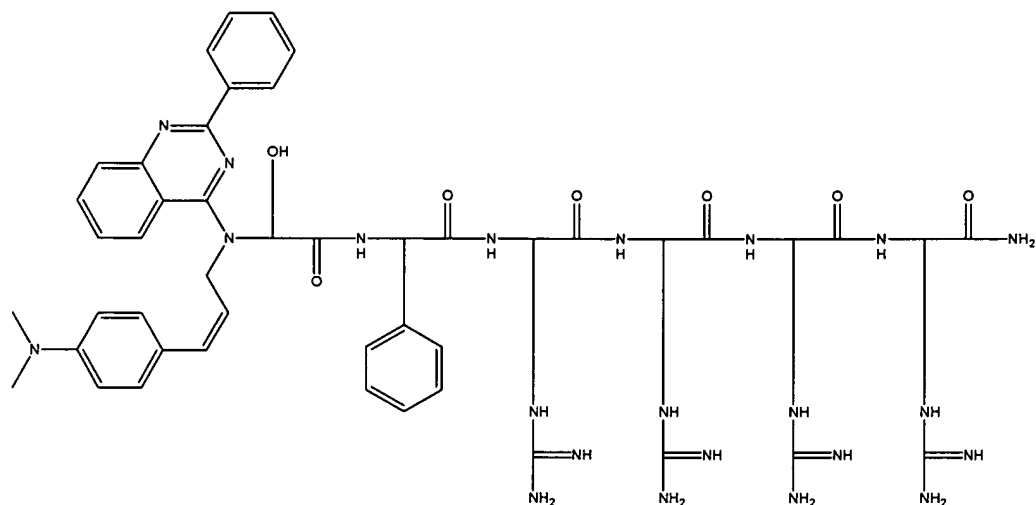
Compound 127



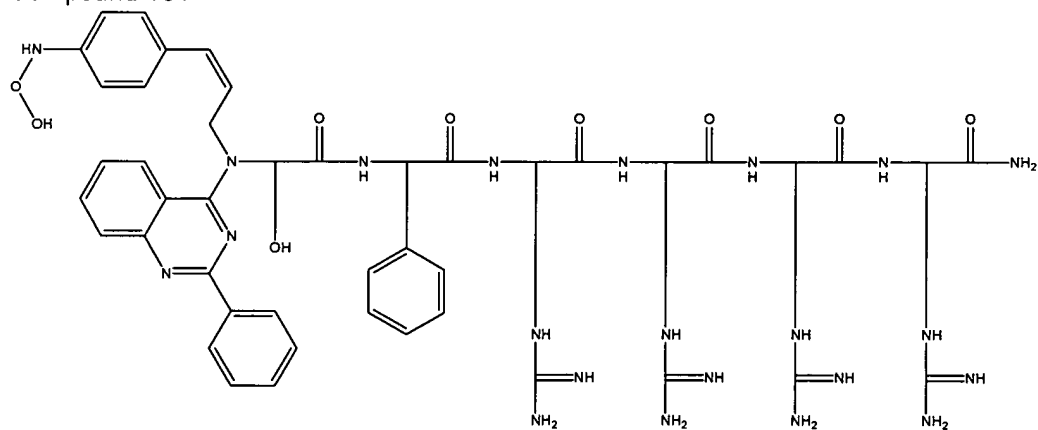
Compound 128



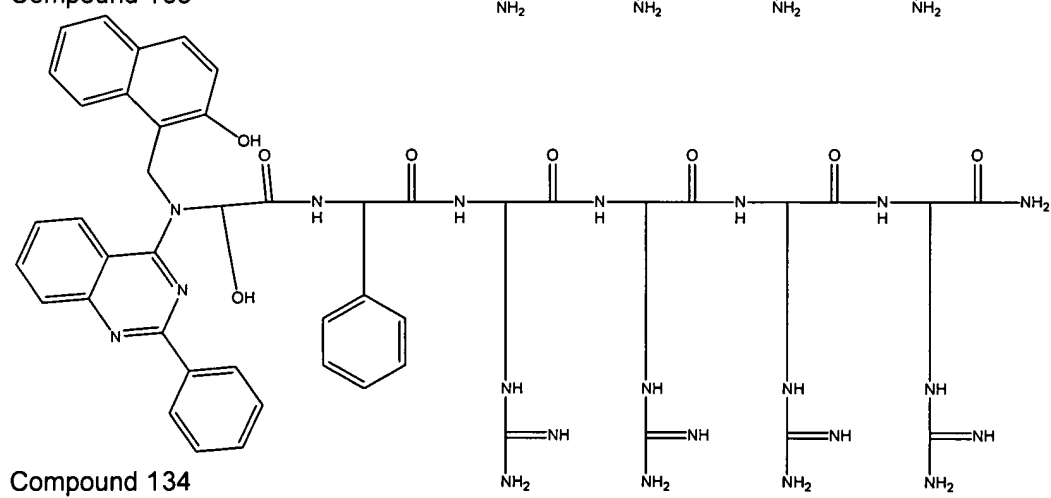
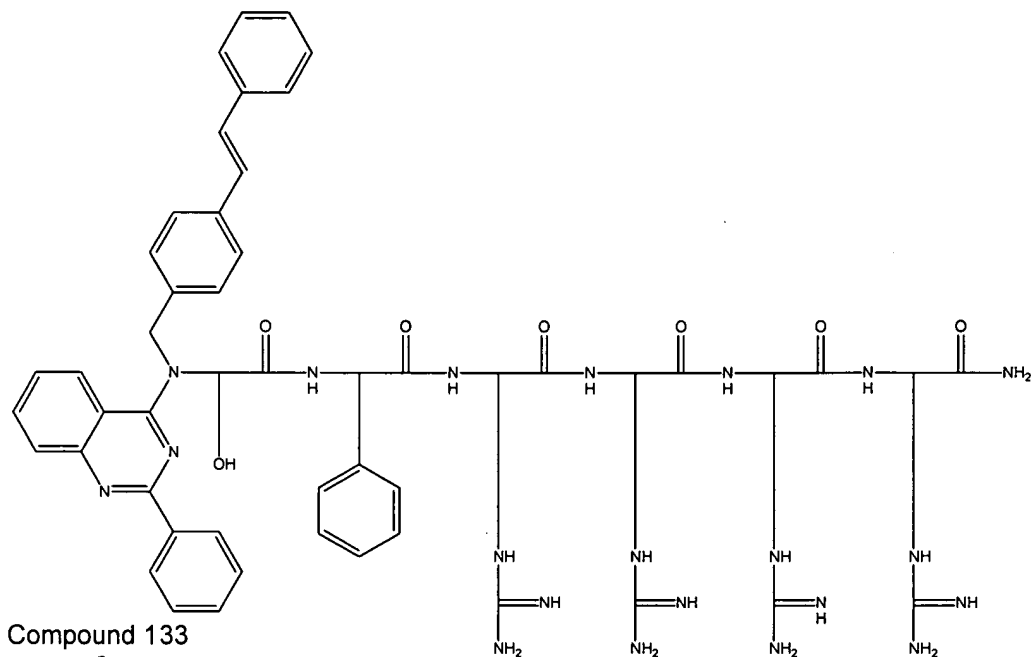
Applicant: David S. Lawrence
Serial No.: 10/755,086
Filed: January 9, 2004
page 59 of 190

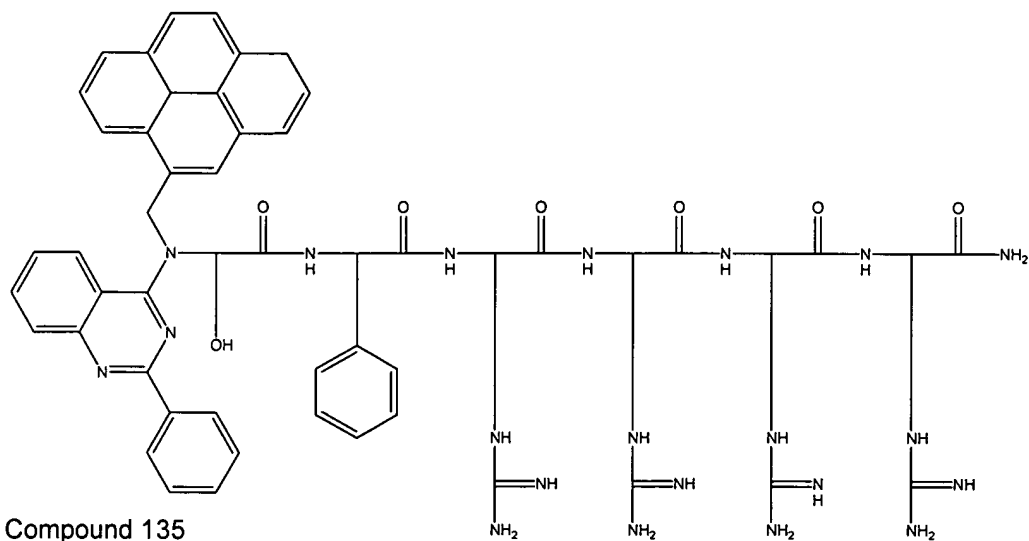


Compound 131

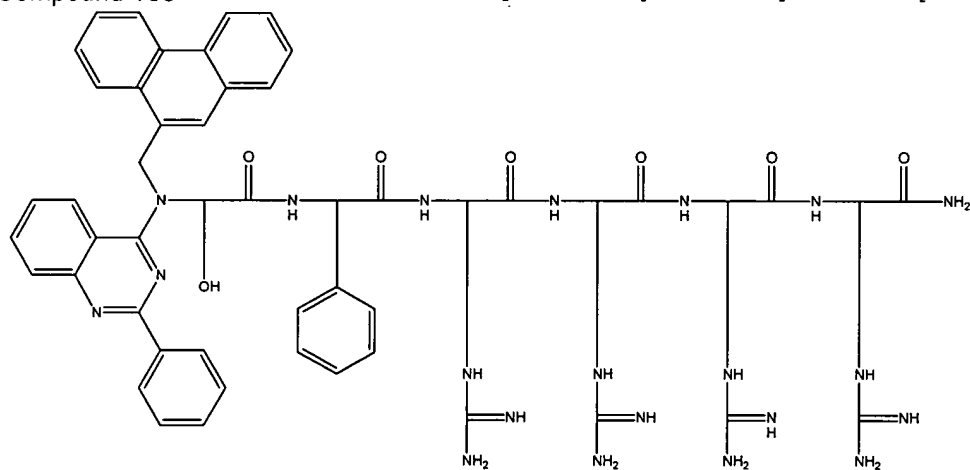


Compound 132

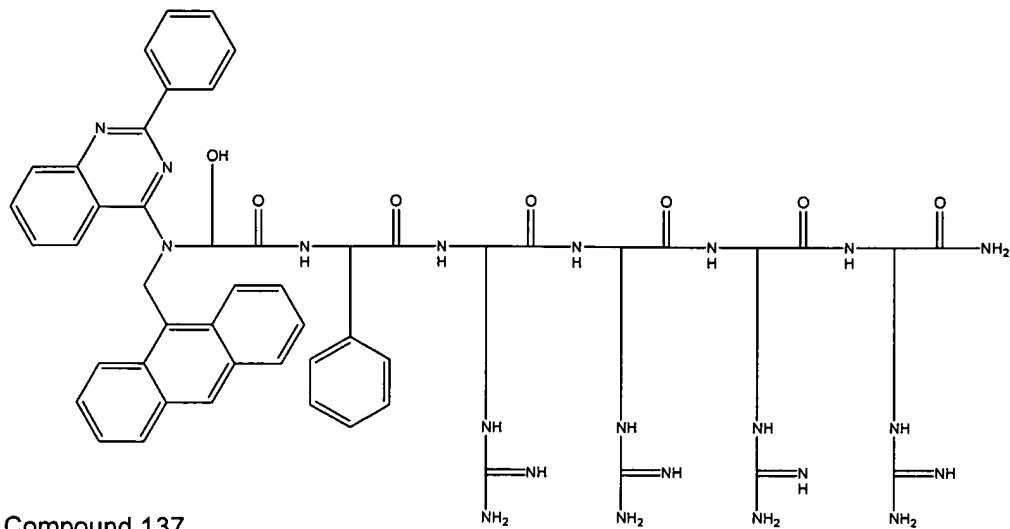




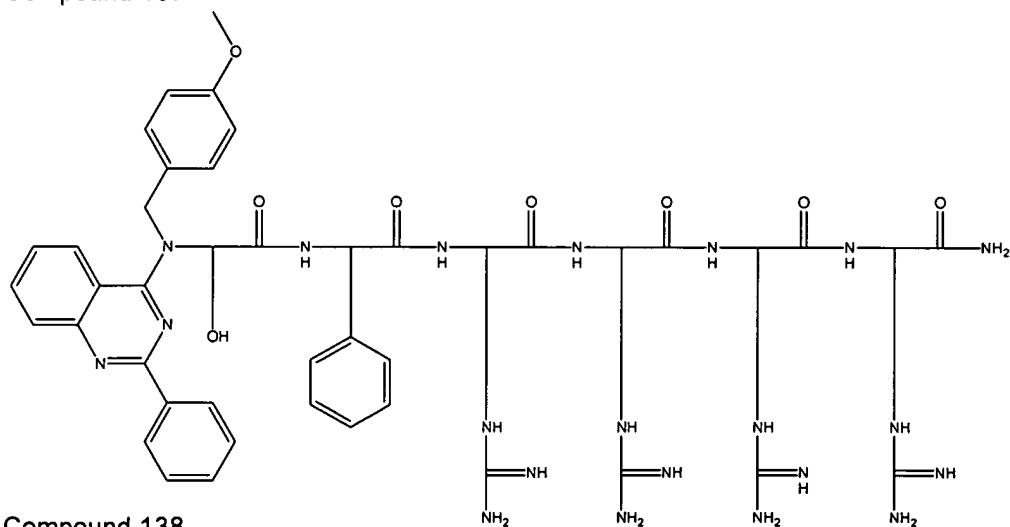
Compound 135



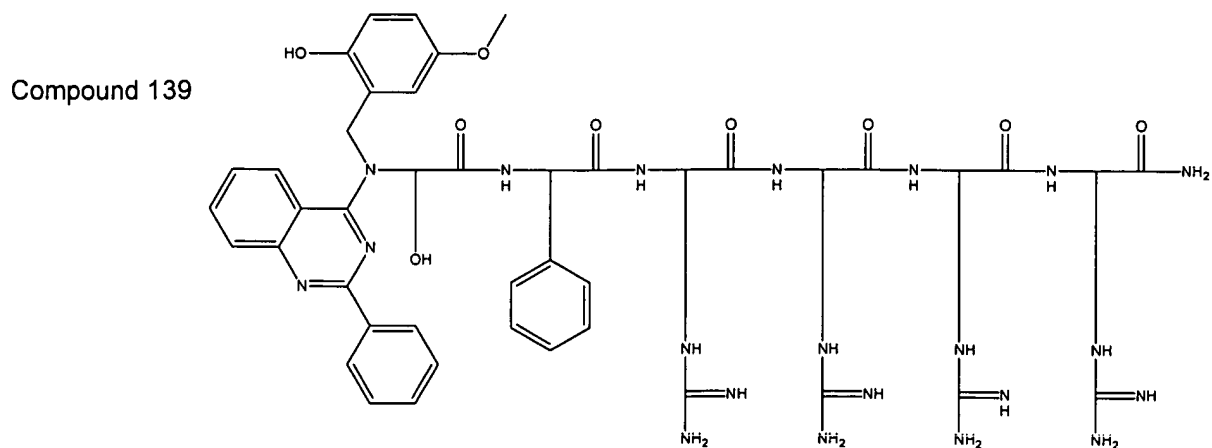
Compound 136



Compound 137



Compound 138

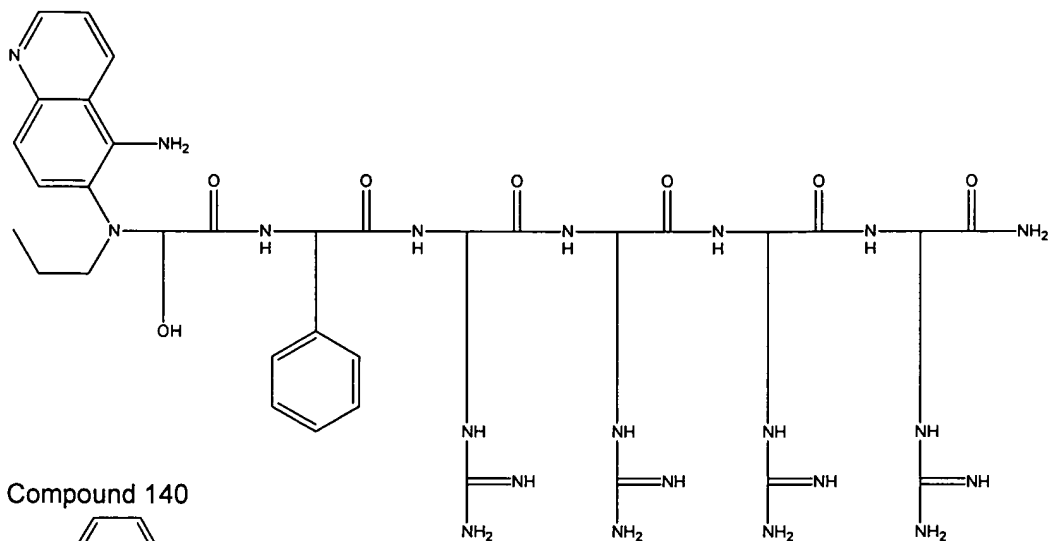


Applicant: David S. Lawrence

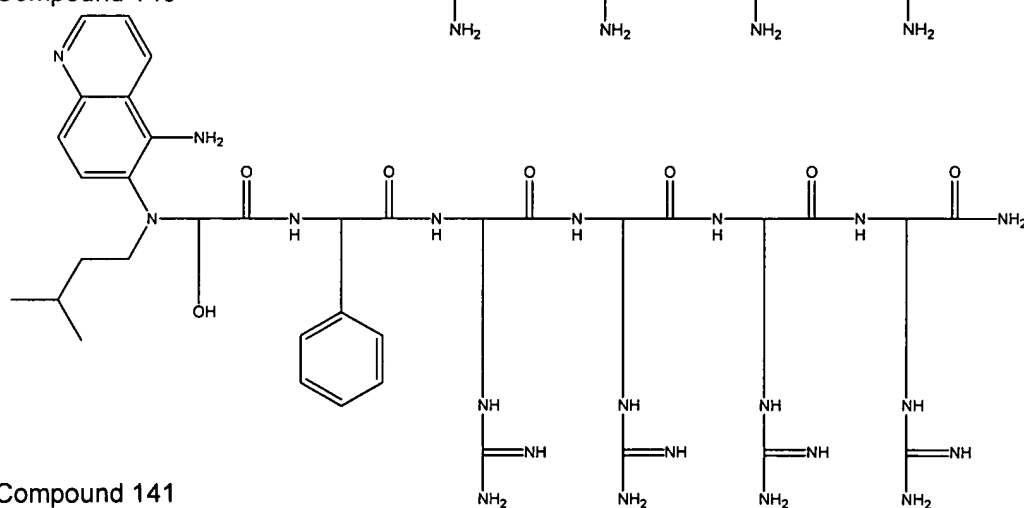
Serial No.: 10/755,086

Filed: January 9, 2004

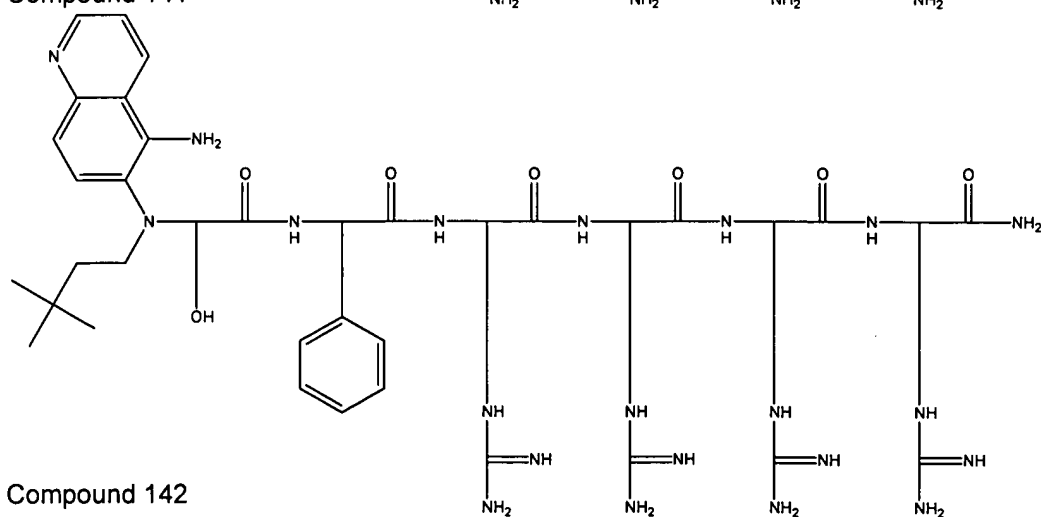
page 63 of 190



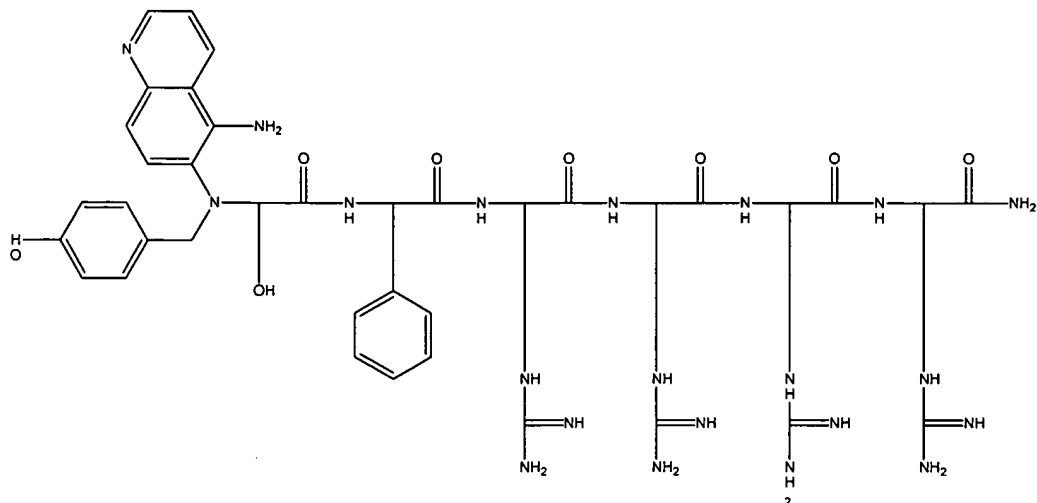
Compound 140



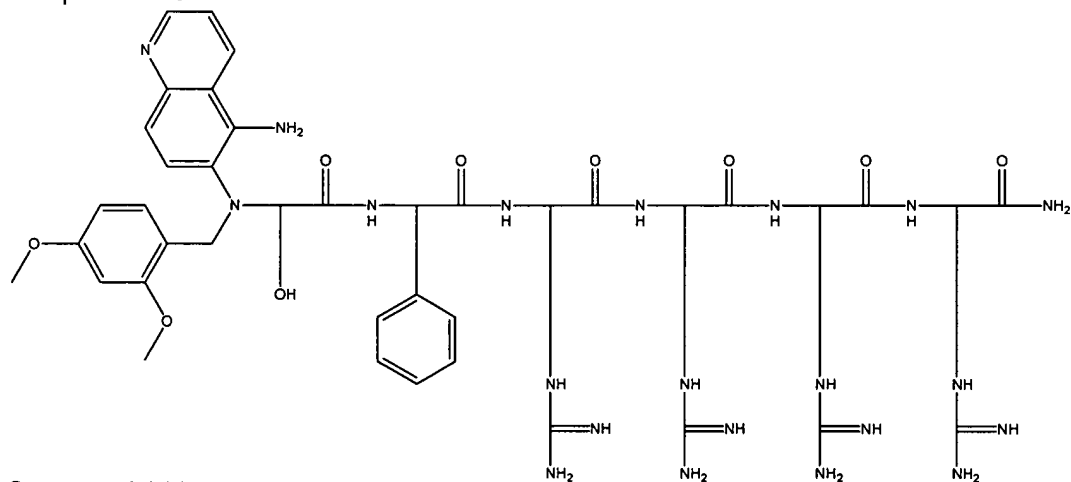
Compound 141



Compound 142

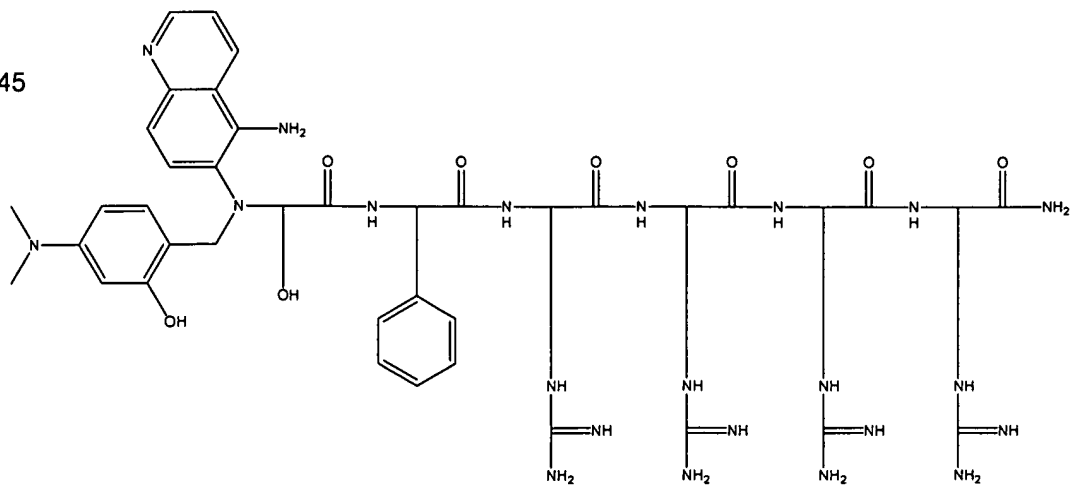


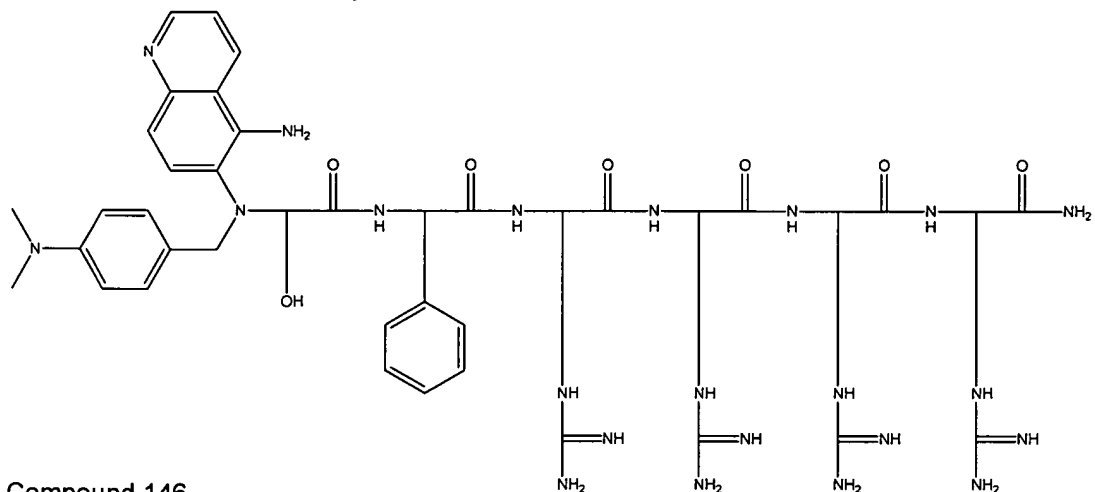
Compound 143



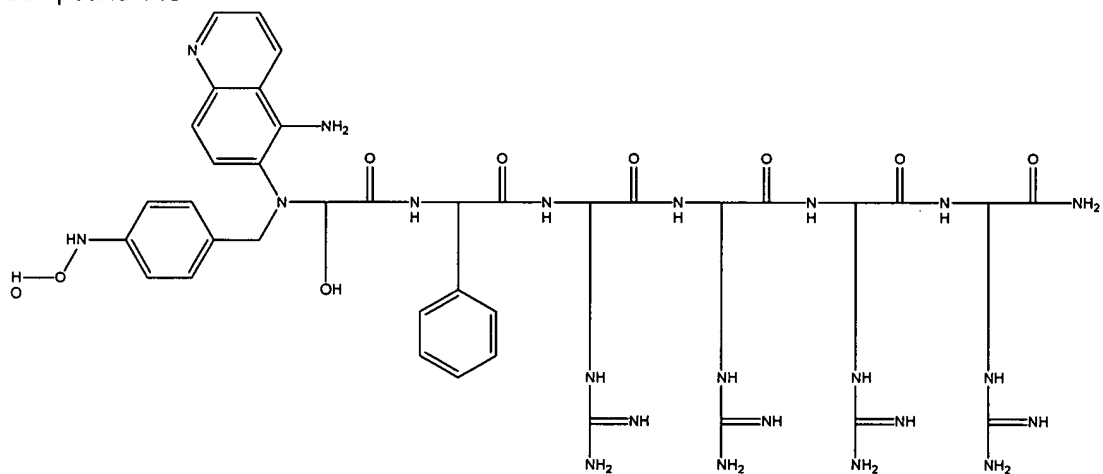
Compound 144

Compound 145

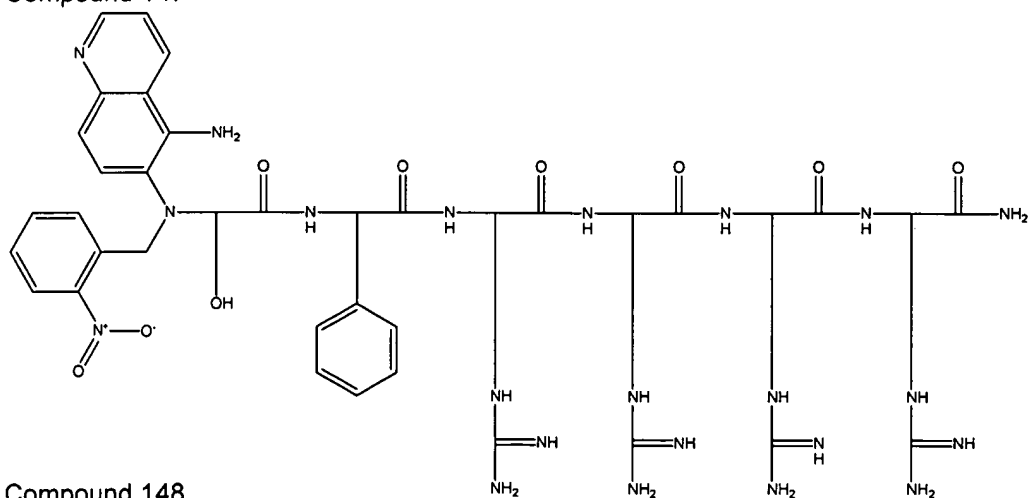




Compound 146

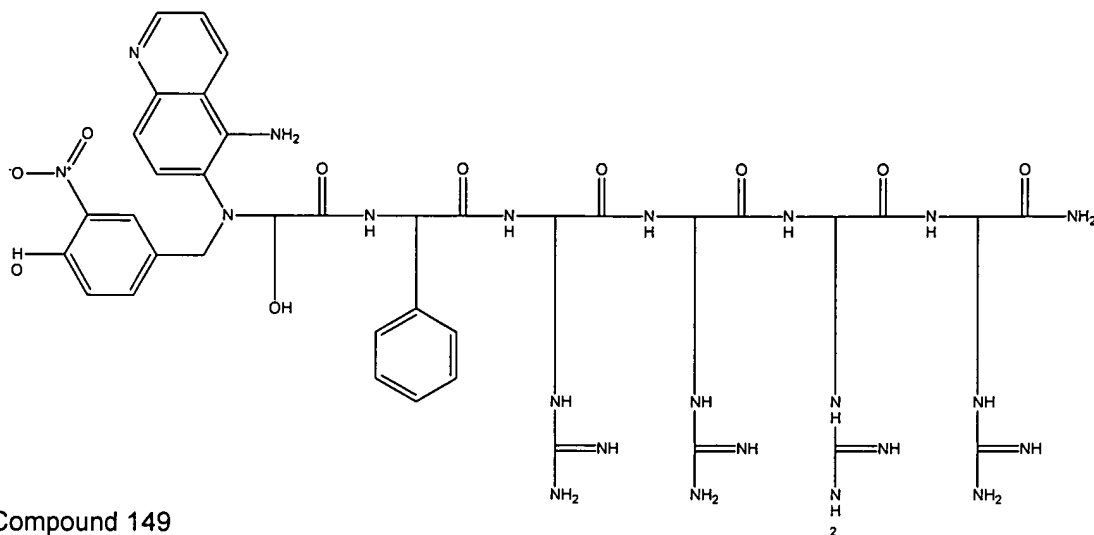


Compound 147

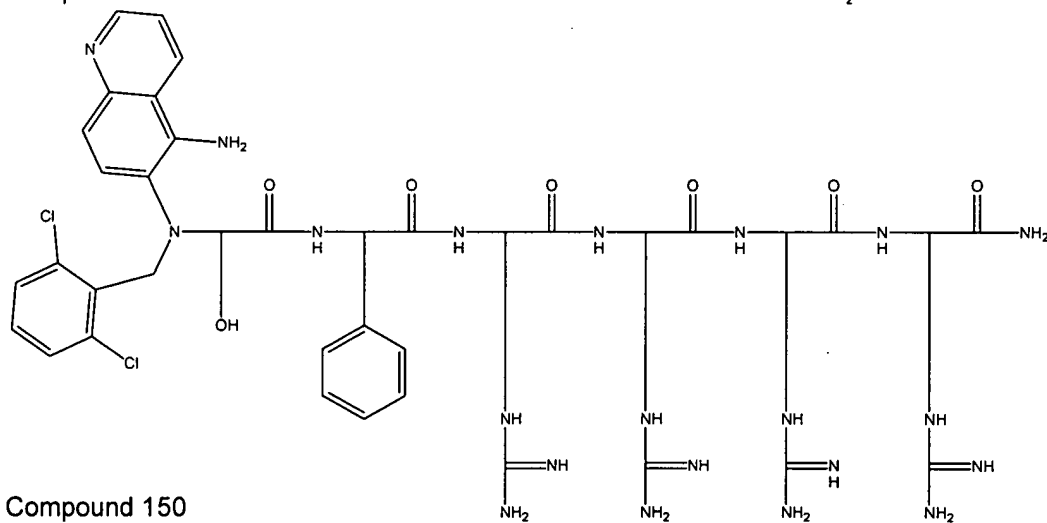


Compound 148

page 66 of 190

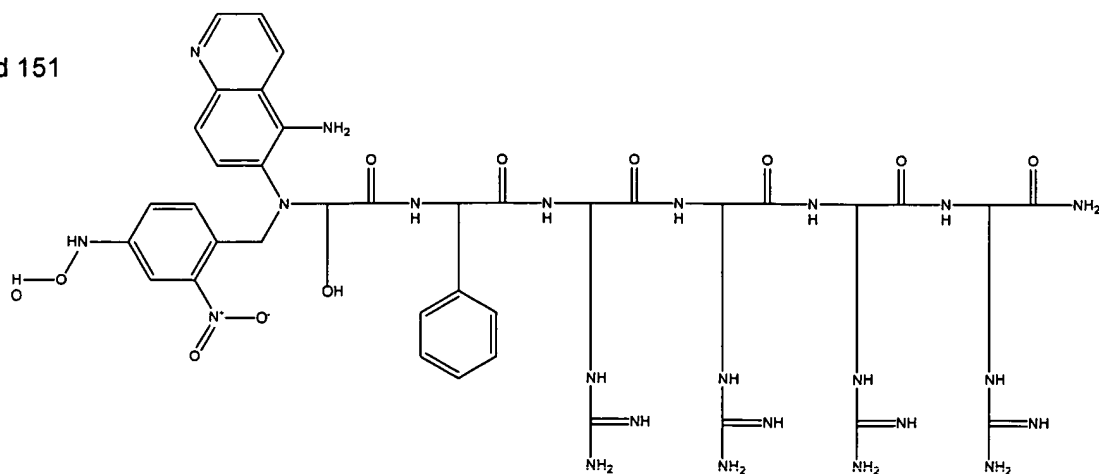


Compound 149

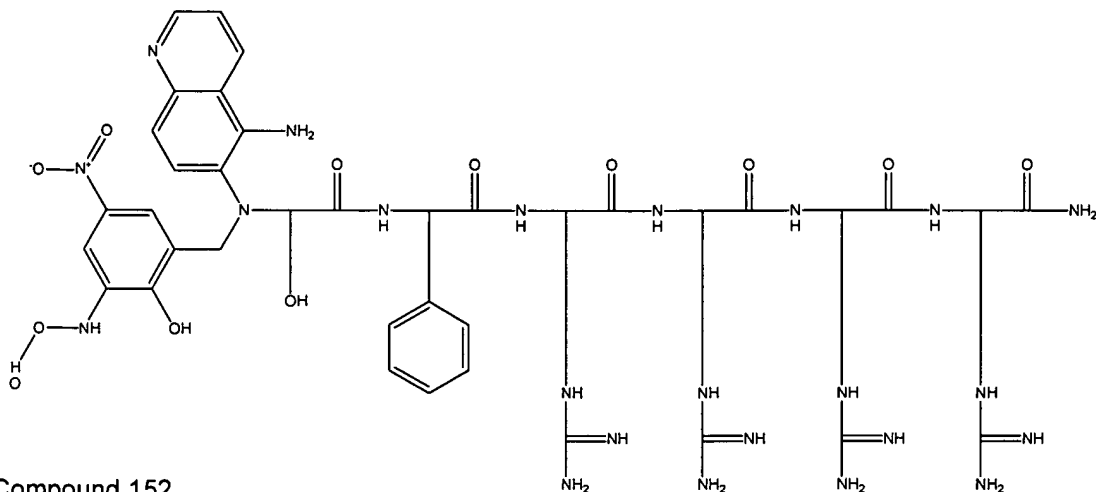


Compound 150

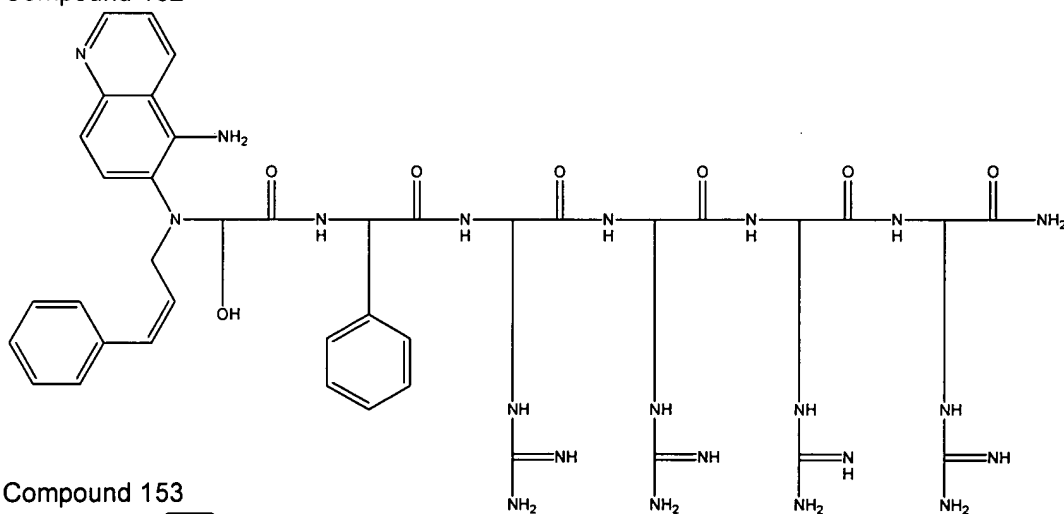
Compound 151



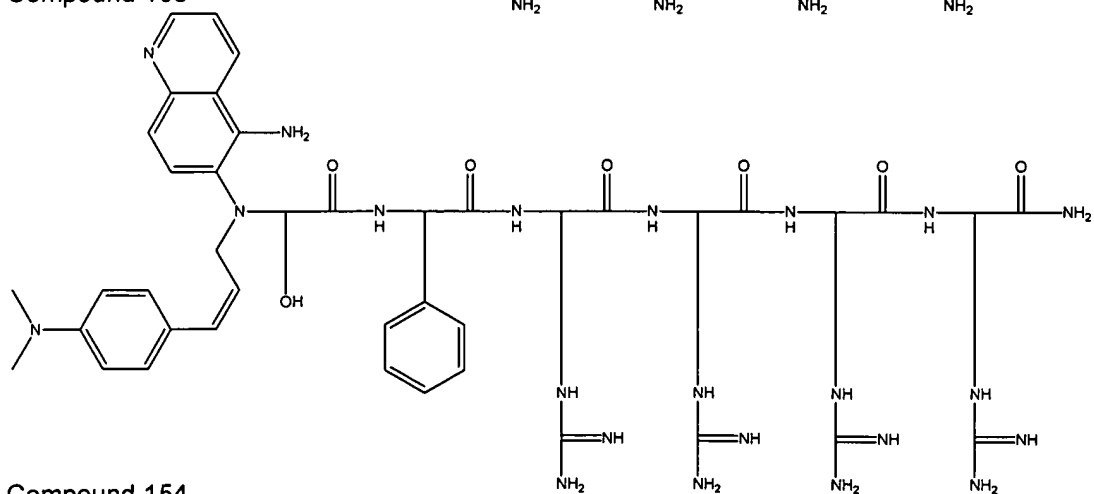
page 67 of 190



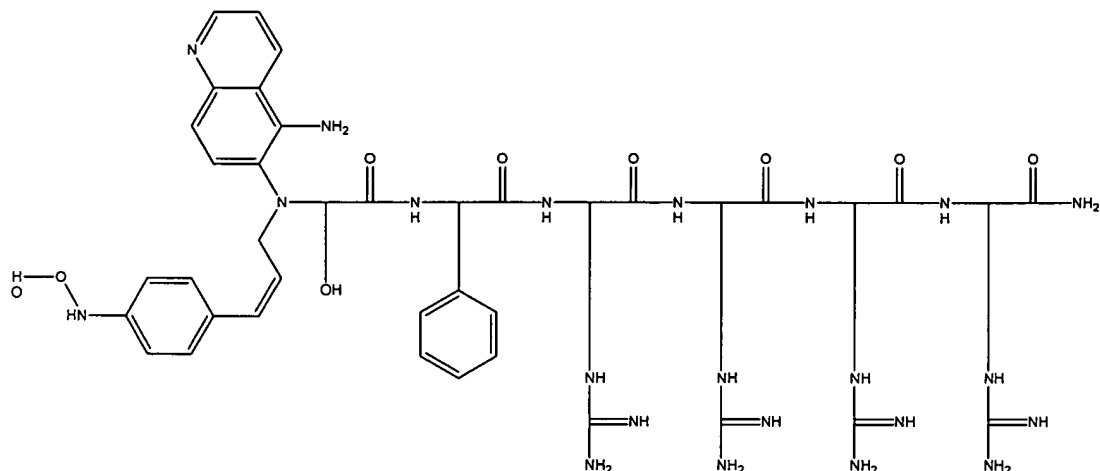
Compound 152



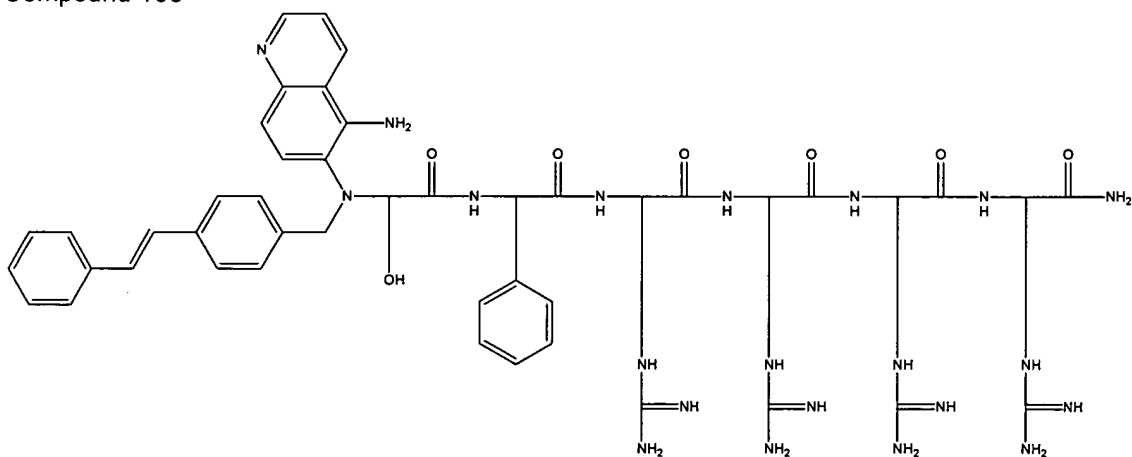
Compound 153



Compound 154

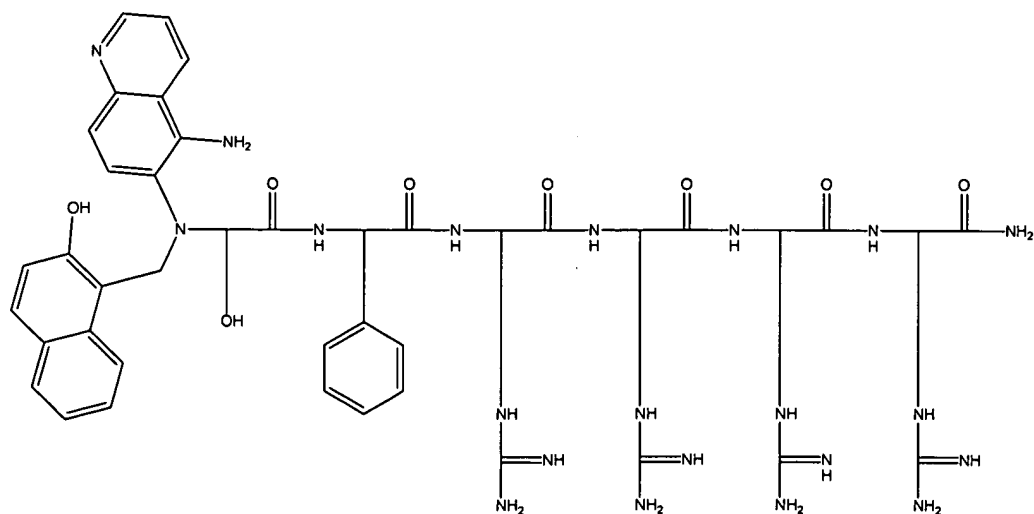


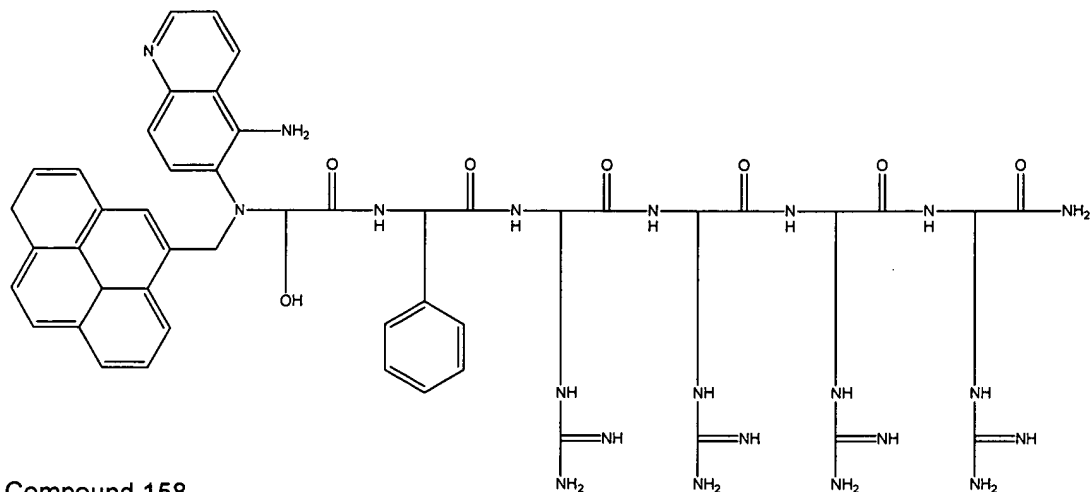
Compound 155



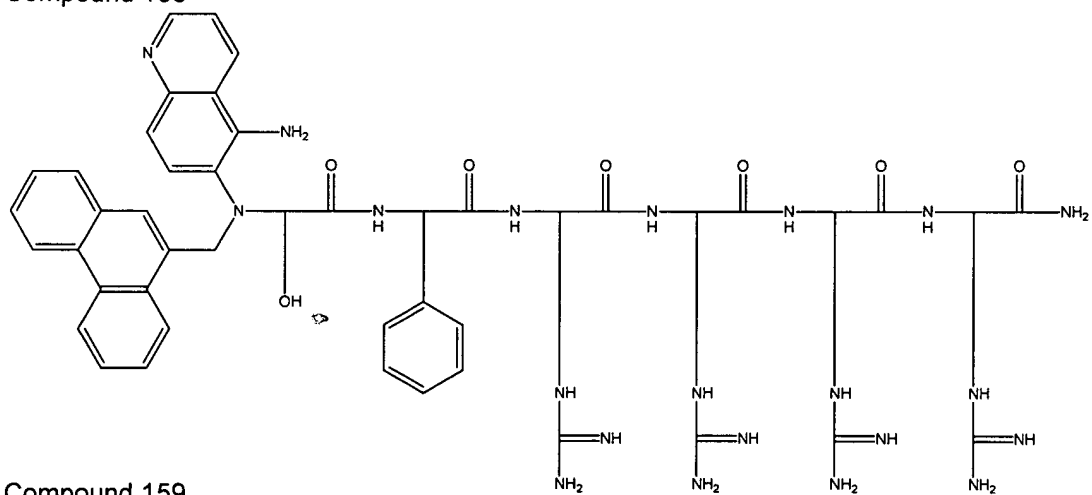
Compound 156

Compound 157

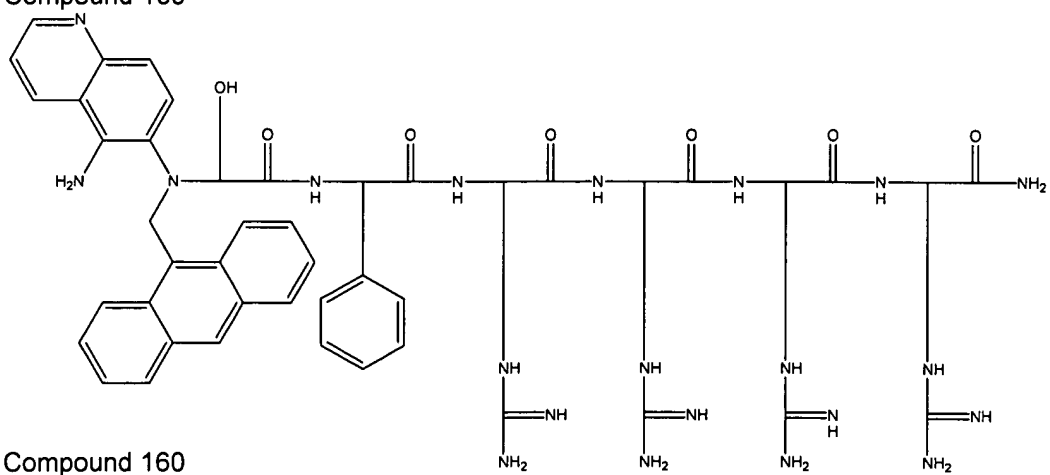




Compound 158

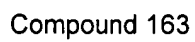


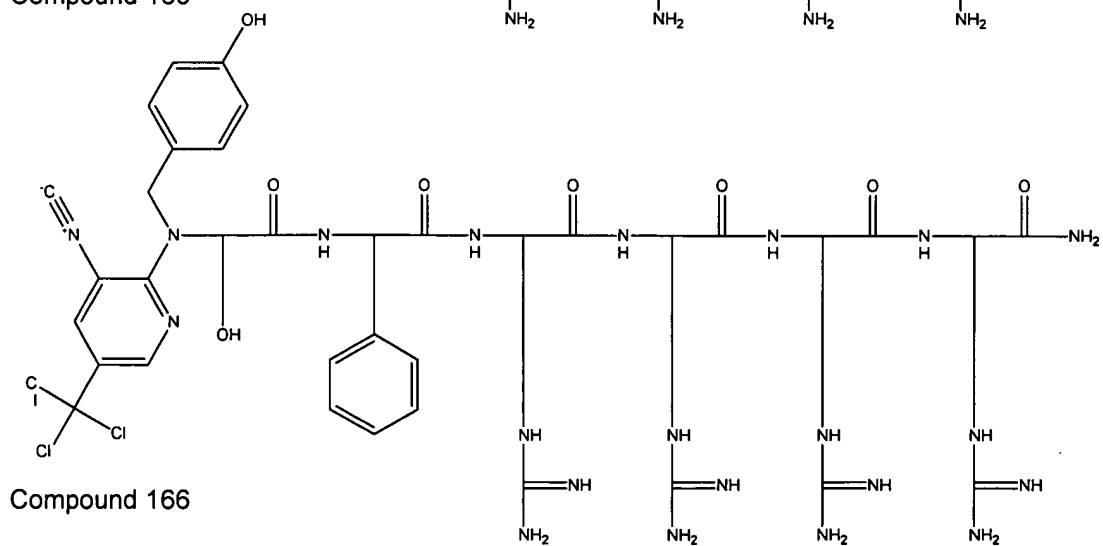
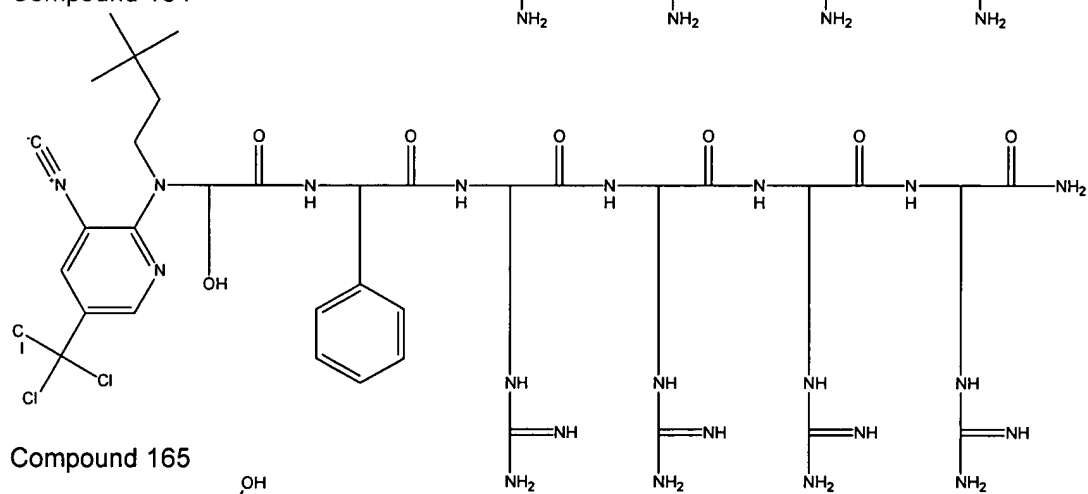
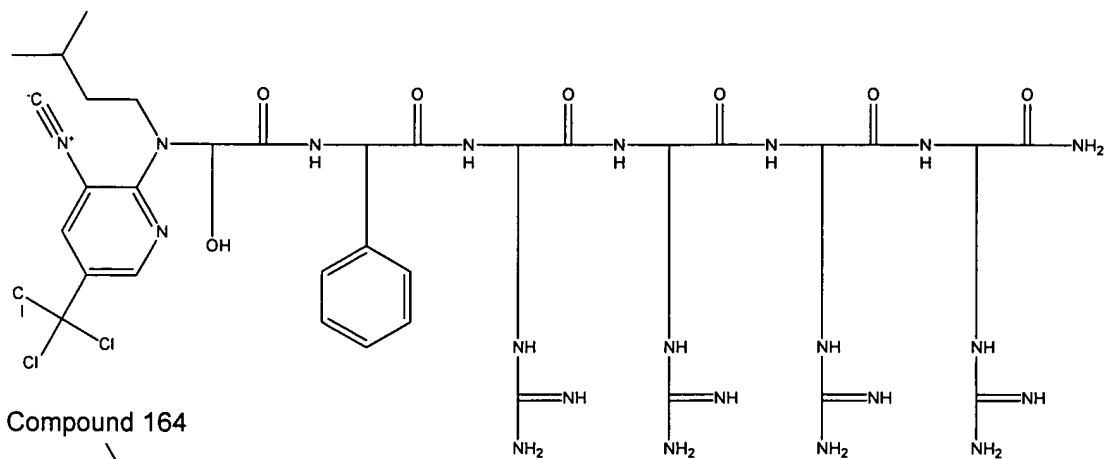
Compound 159

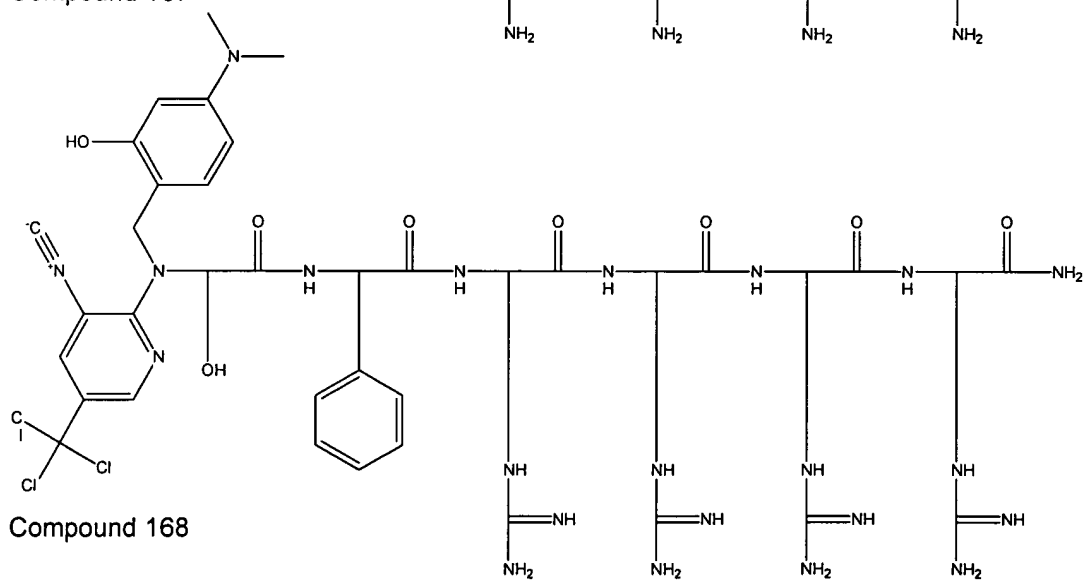
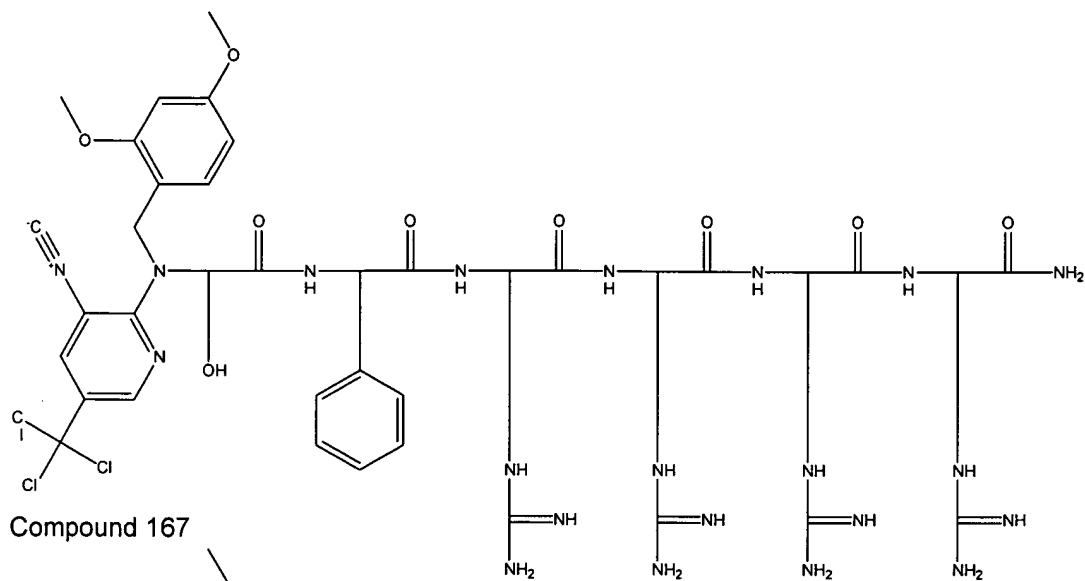


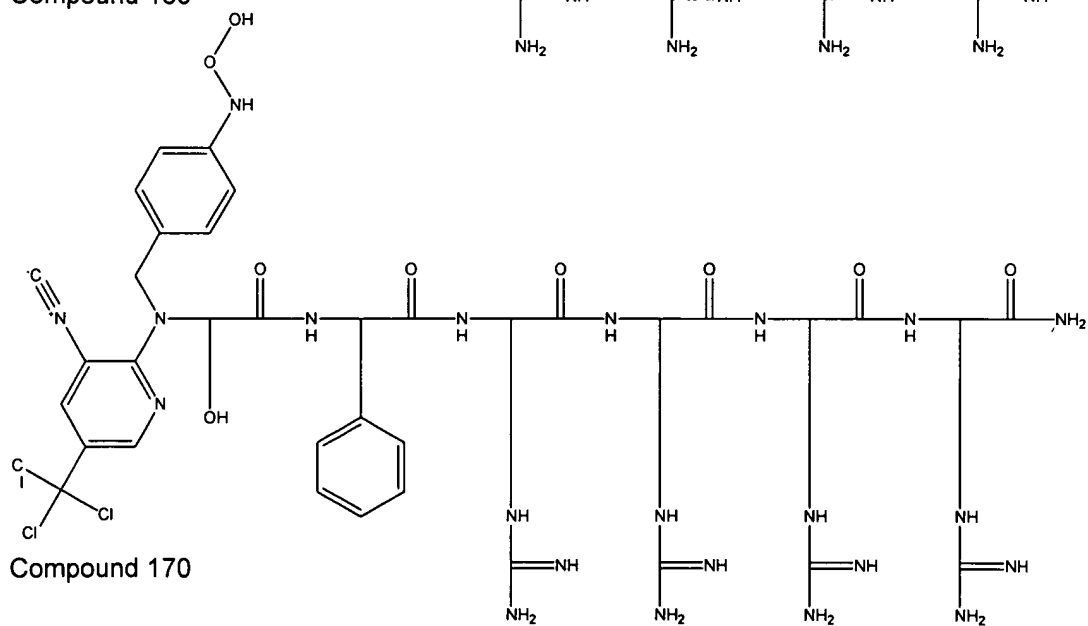
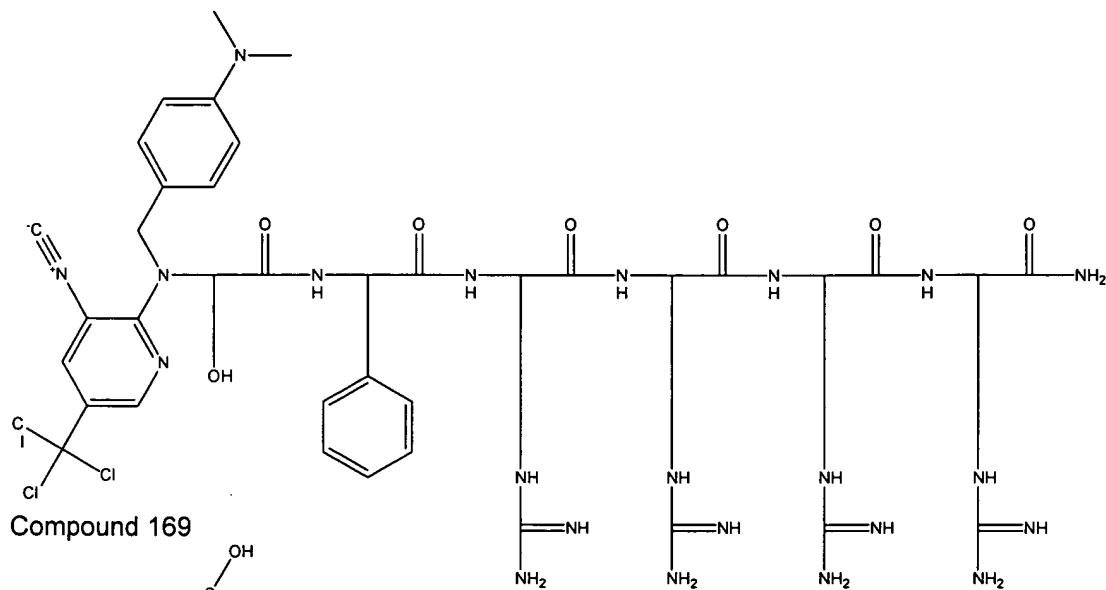
Compound 160

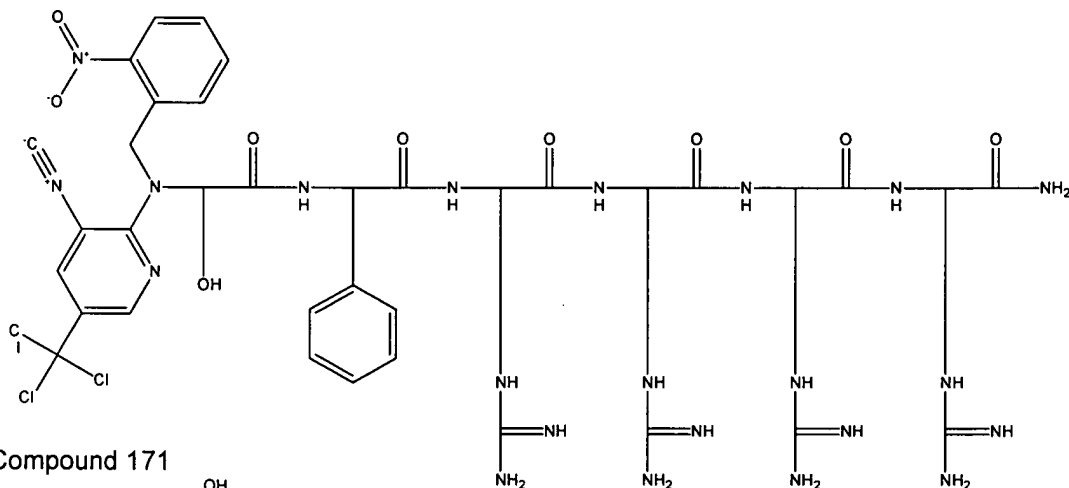
page 70 of 190



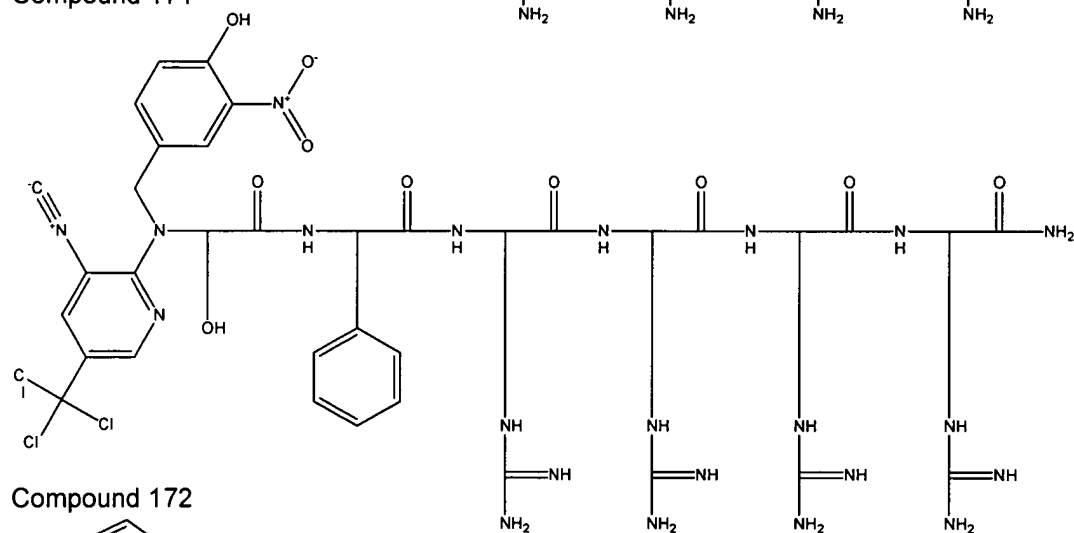




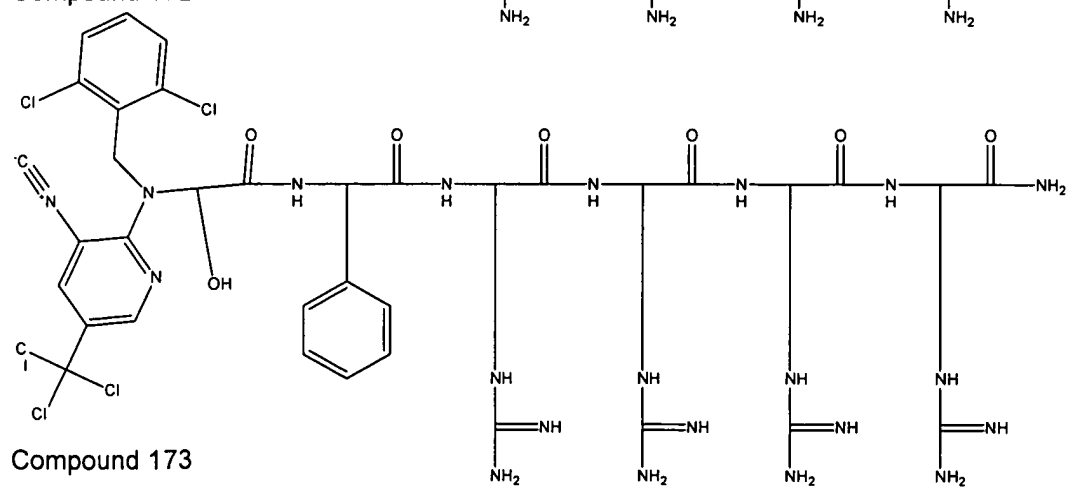




Compound 171



Compound 172



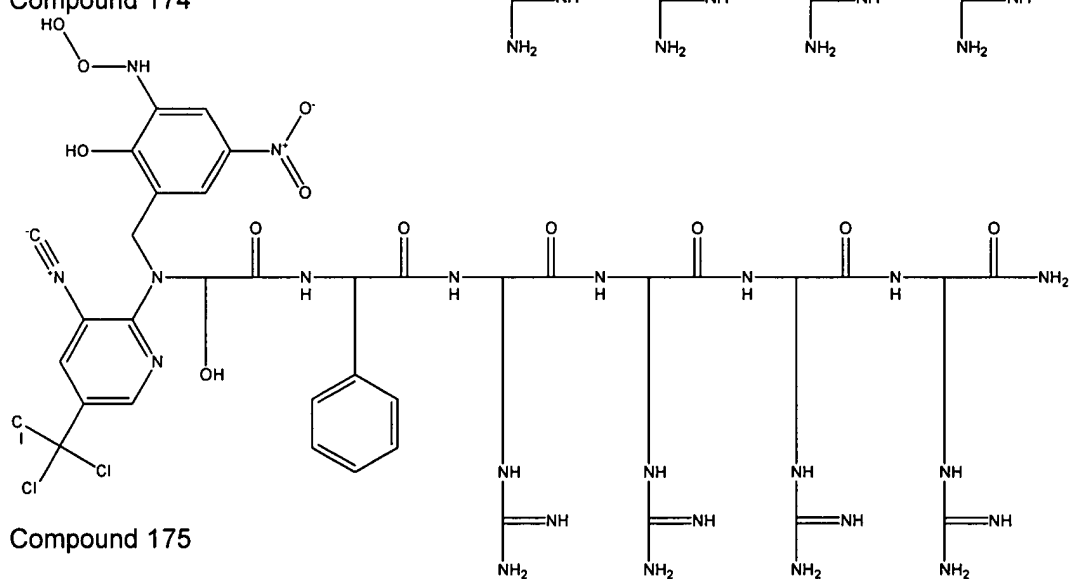
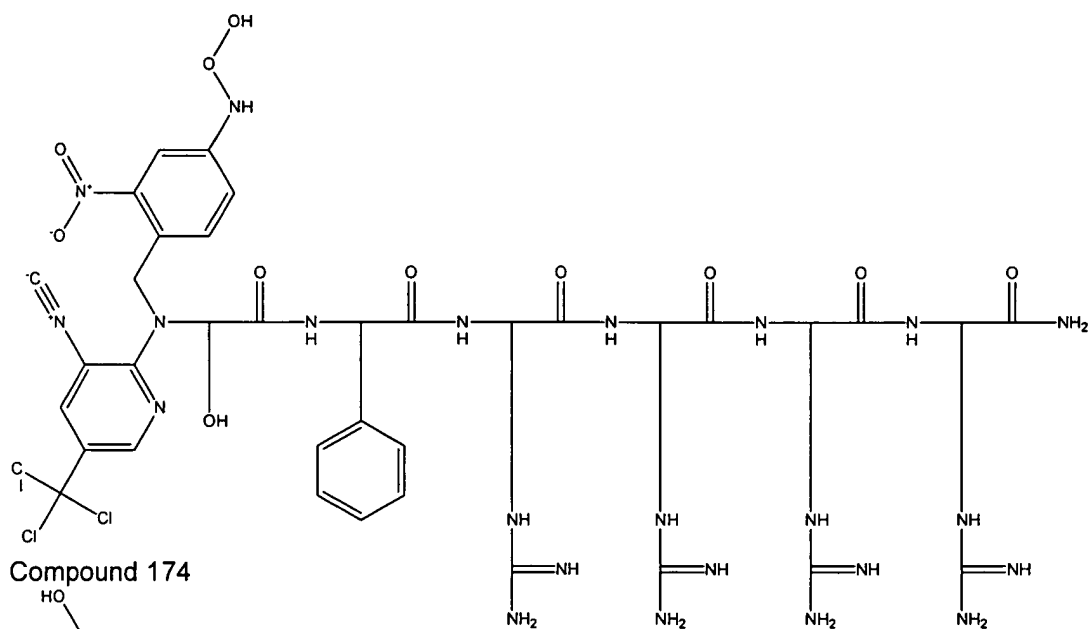
Compound 173

Applicant: David S. Lawrence

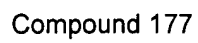
Serial No.: 10/755,086

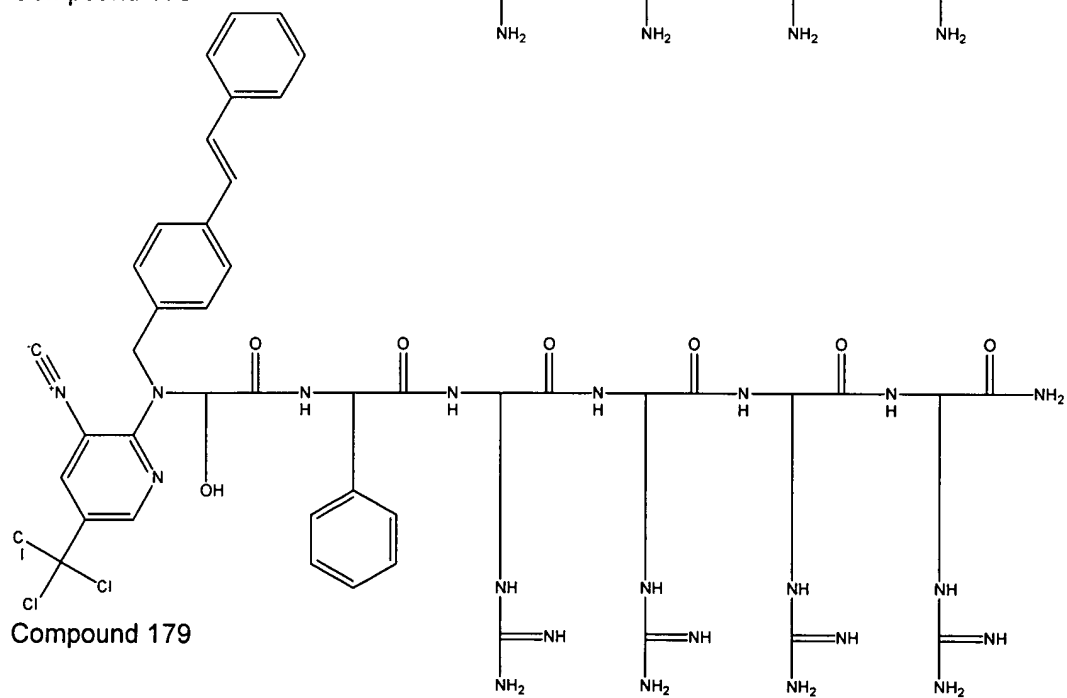
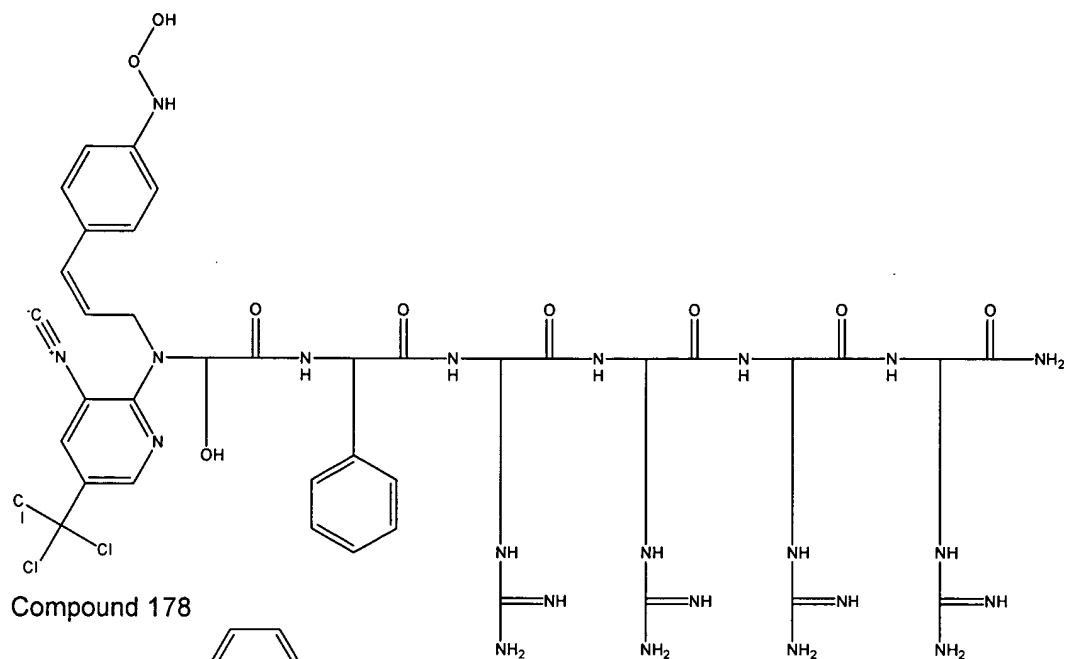
Filed: January 9, 2004

page 75 of 190

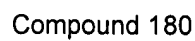


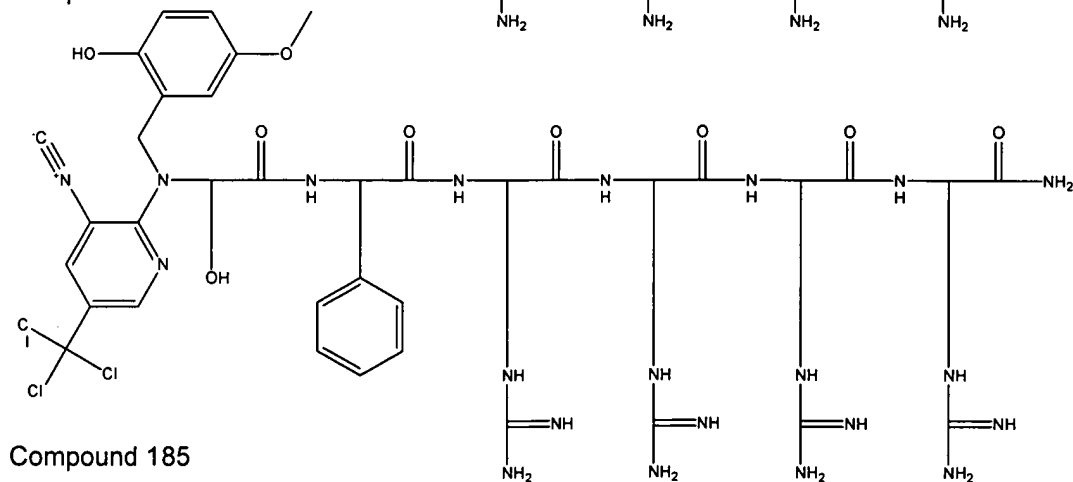
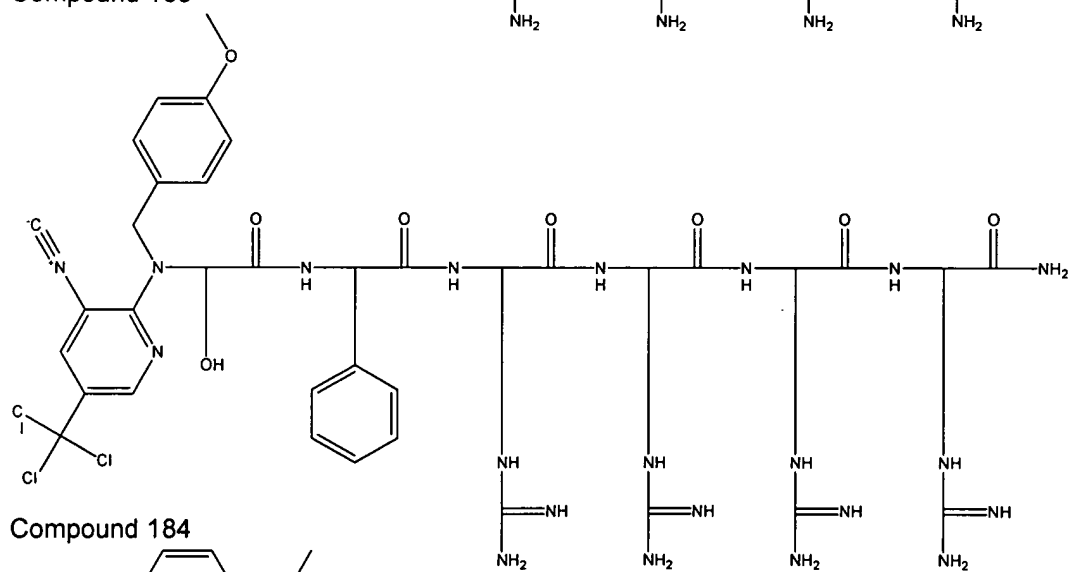
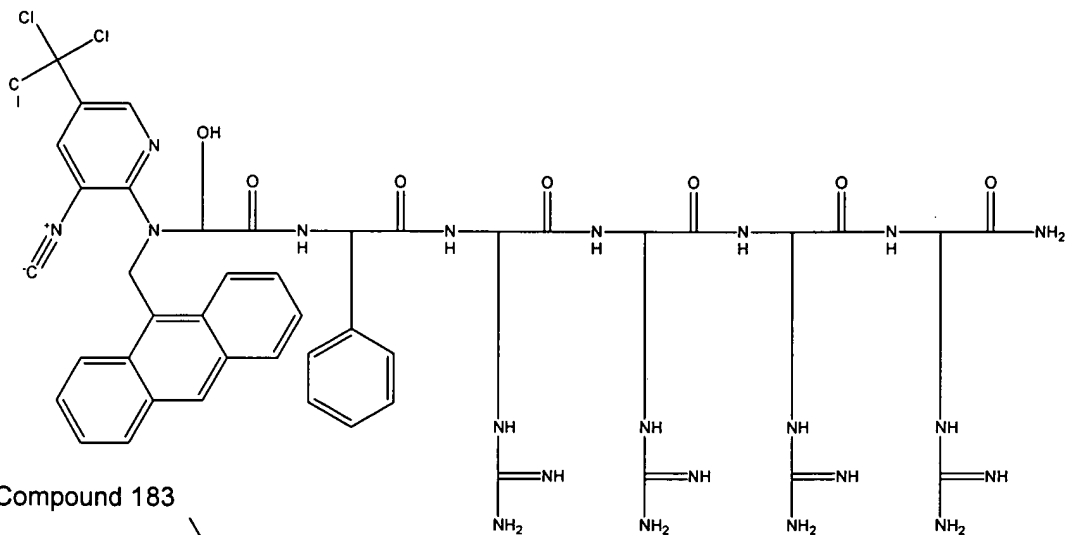
page 76 of 190

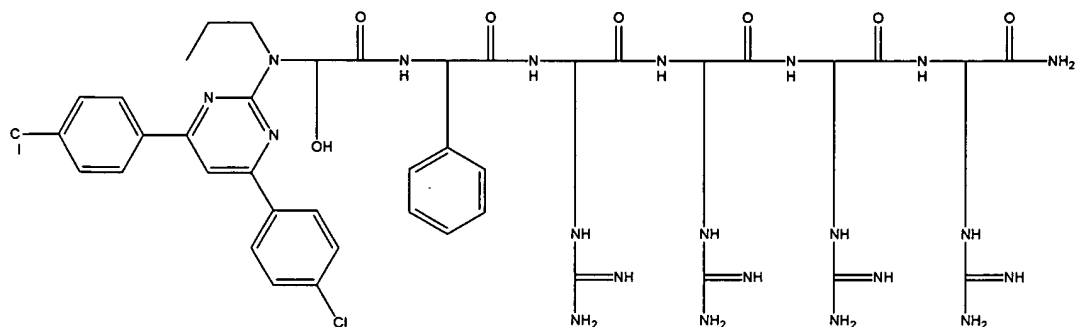




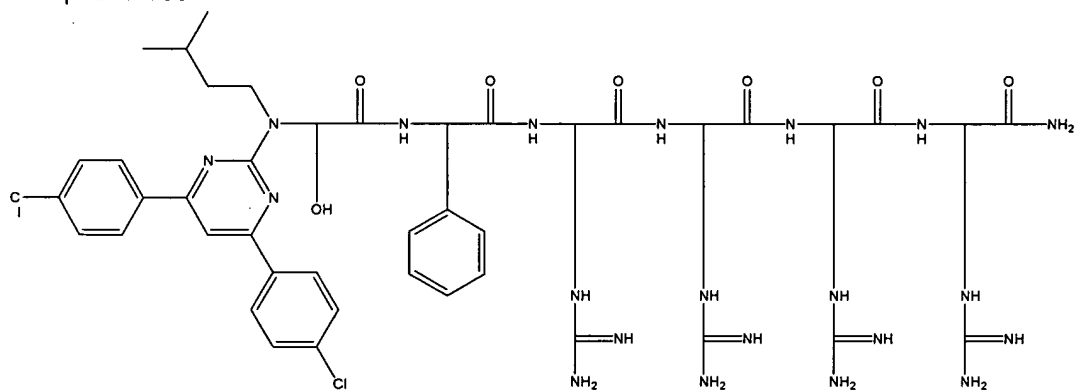
page 78 of 190



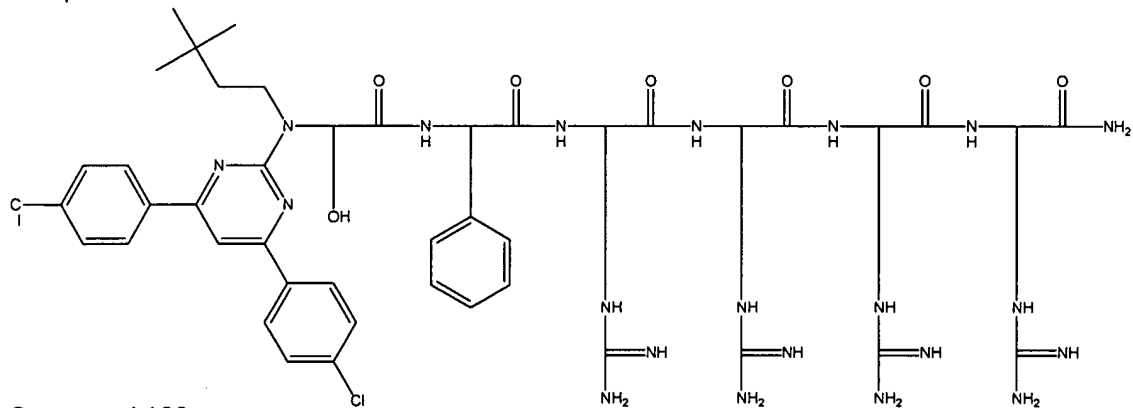




Compound 186



Compound 187



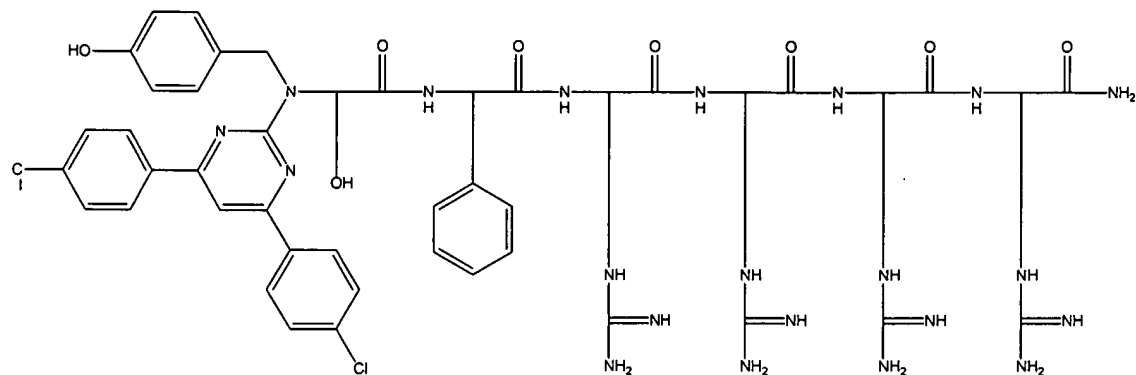
Compound 188

Applicant: David S. Lawrence

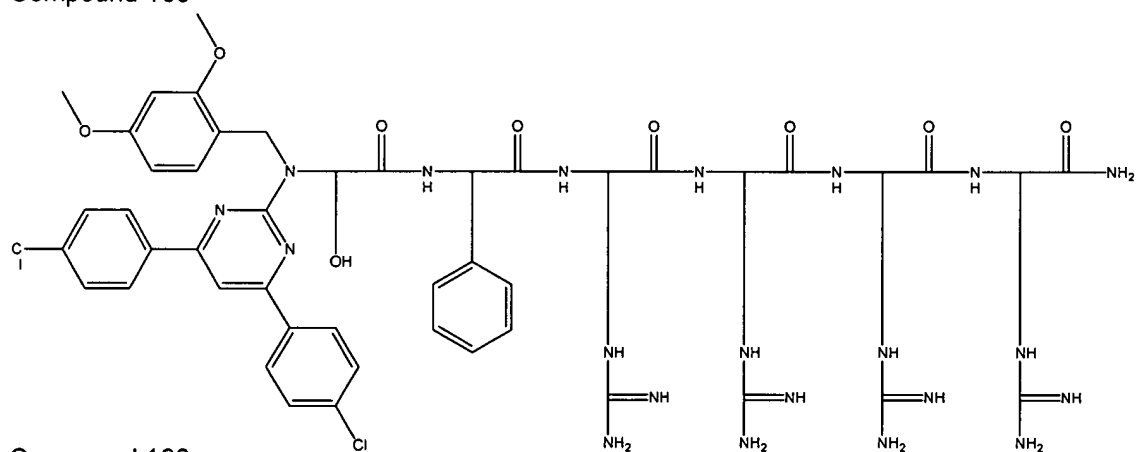
Serial No.: 10/755,086

Filed: January 9, 2004

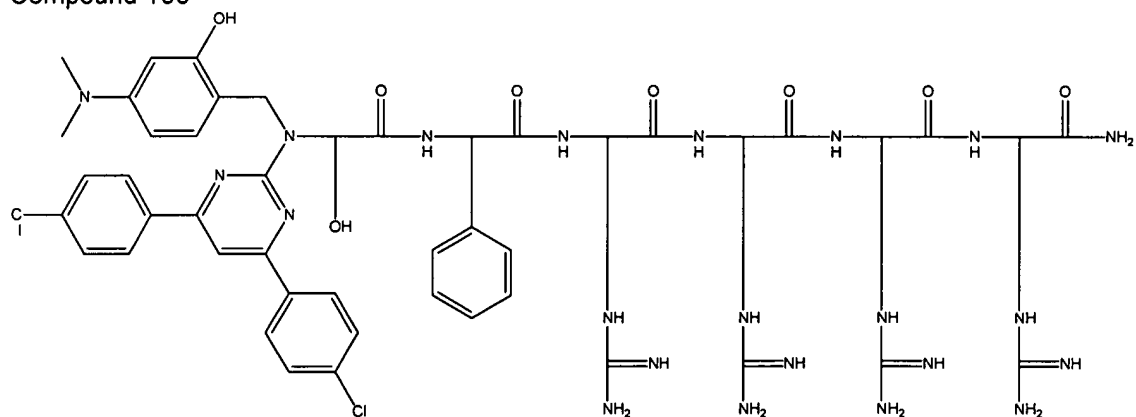
page 81 of 190



Compound 189



Compound 190



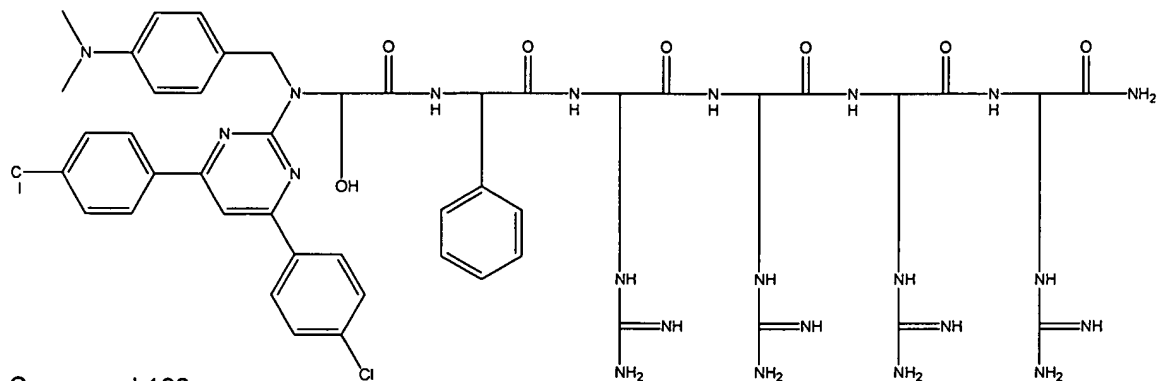
Compound 191

Applicant: David S. Lawrence

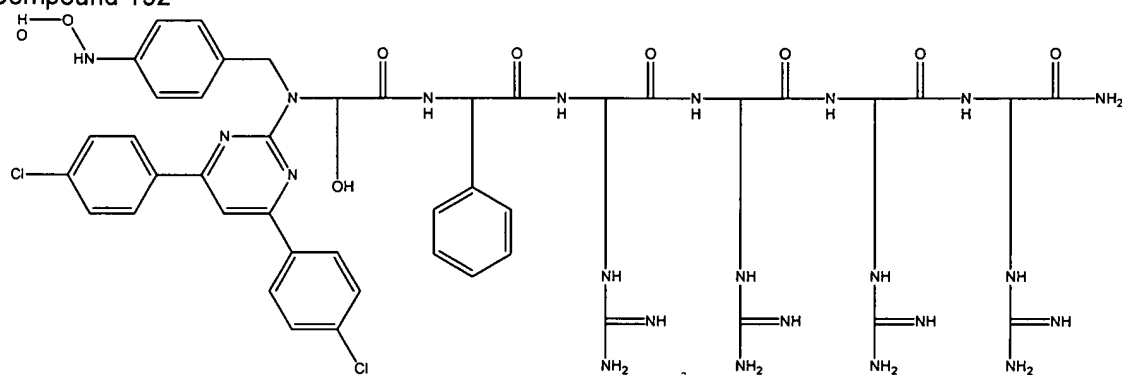
Serial No.: 10/755,086

Filed: January 9, 2004

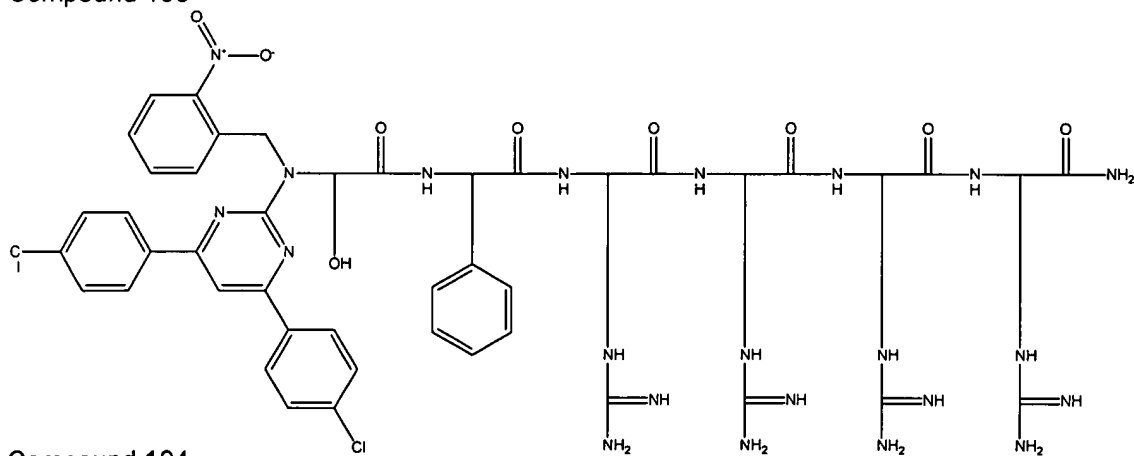
page 82 of 190



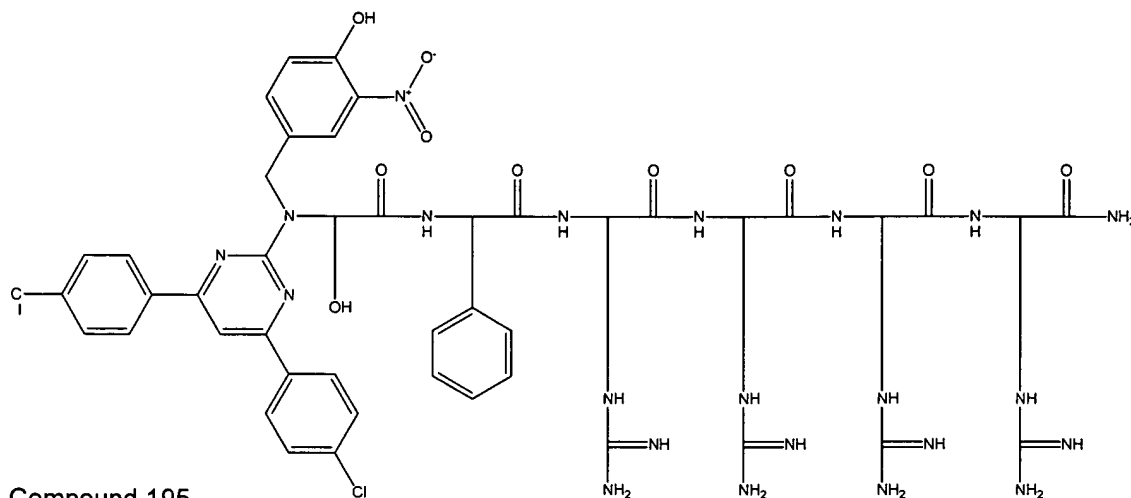
Compound 192



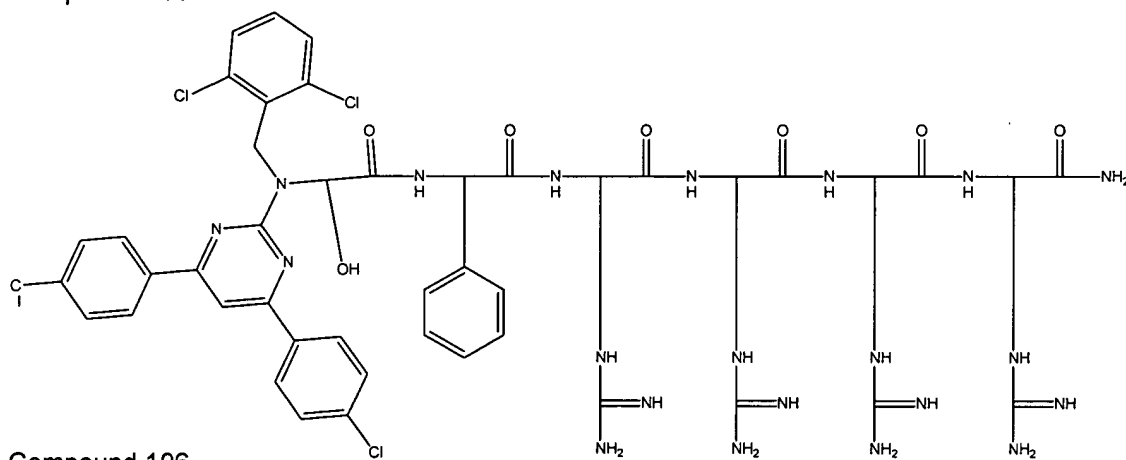
Compound 193



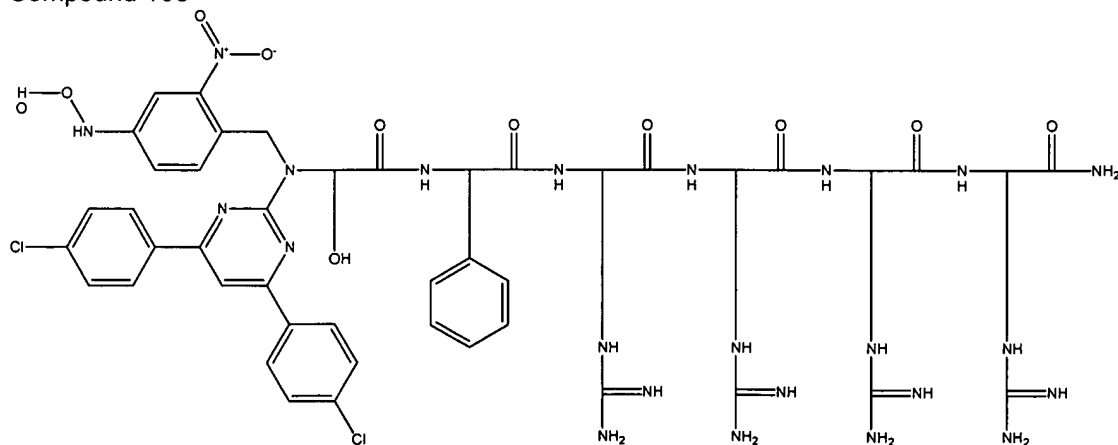
Compound 194



Compound 195



Compound 196



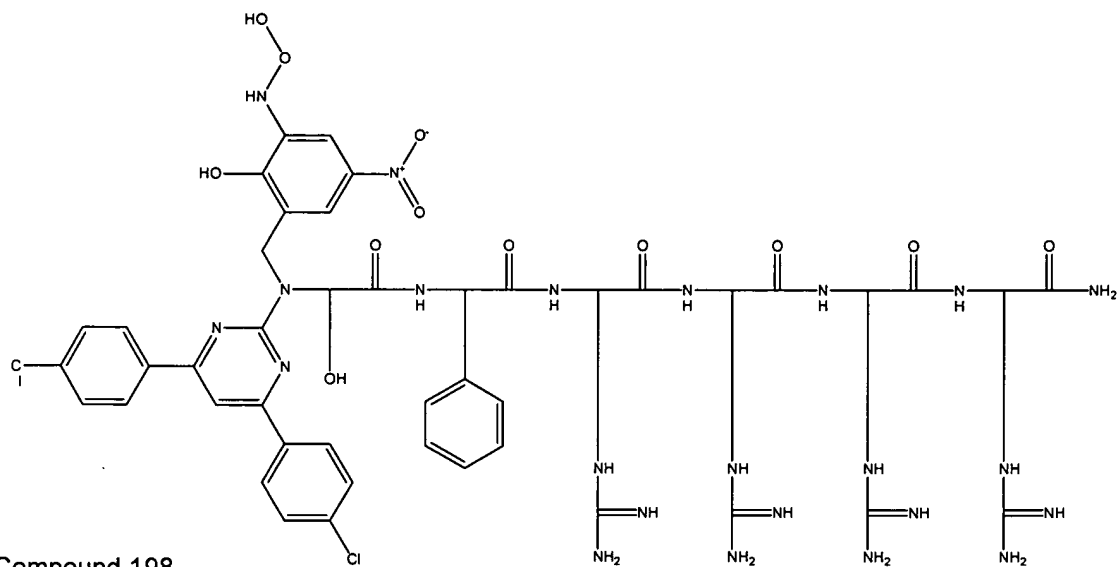
Compound 197

Applicant: David S. Lawrence

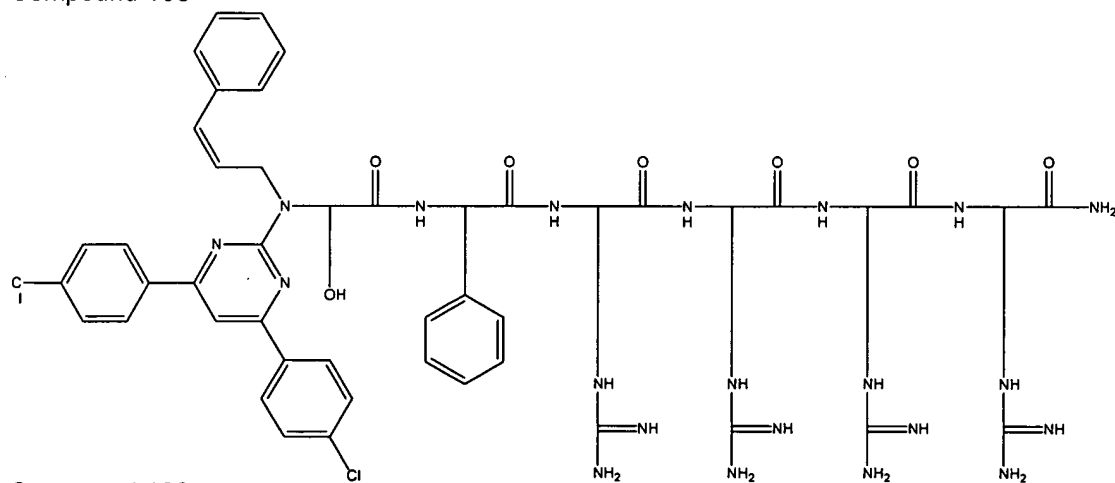
Serial No.: 10/755,086

Filed: January 9, 2004

page 84 of 190



Compound 198



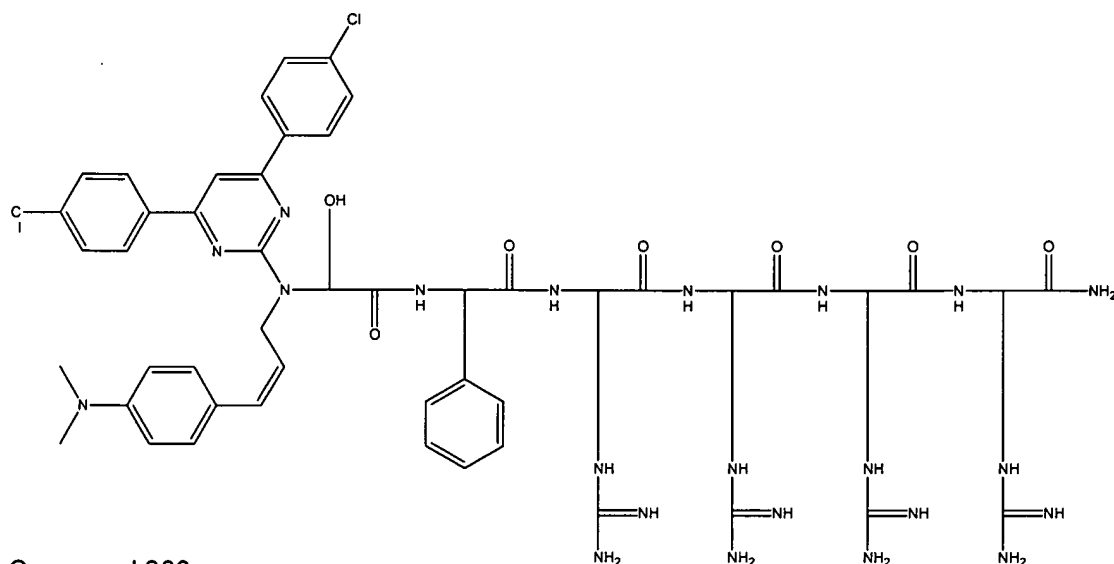
Compound 199

Applicant: David S. Lawrence

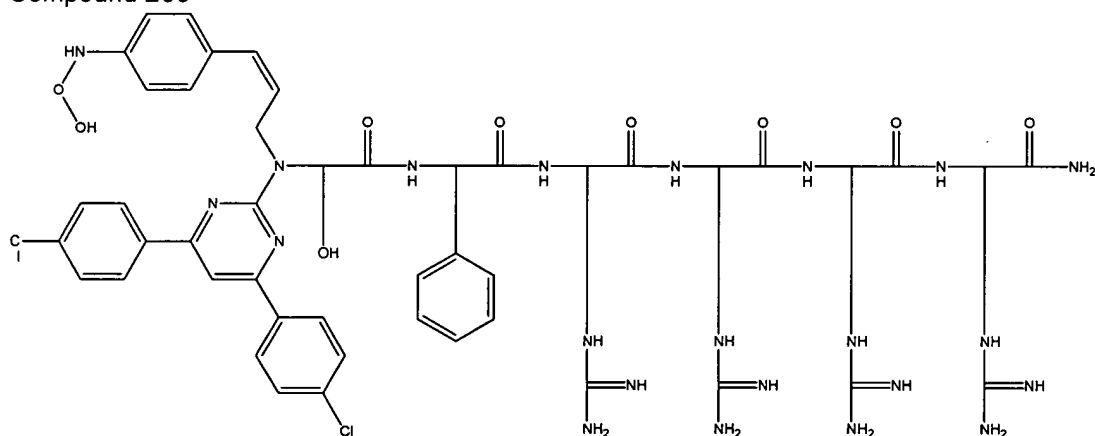
Serial No.: 10/755,086

Filed: January 9, 2004

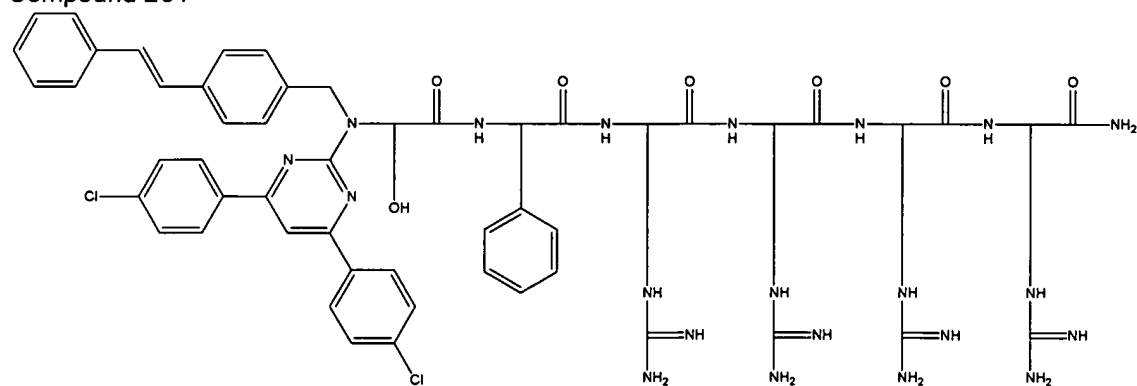
page 85 of 190



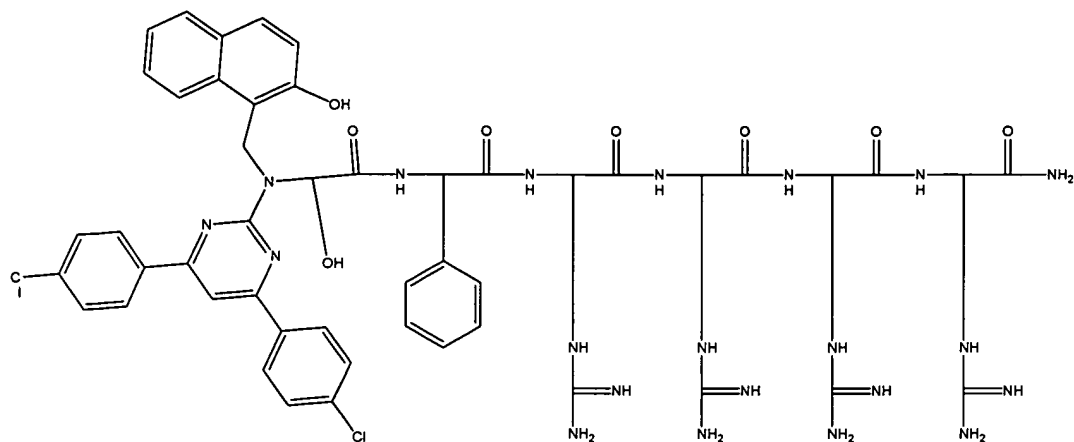
Compound 200



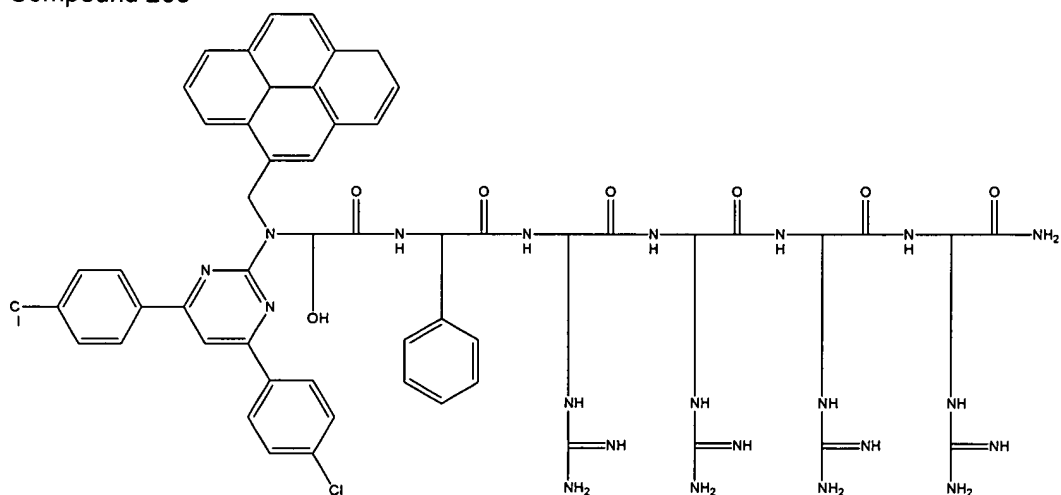
Compound 201



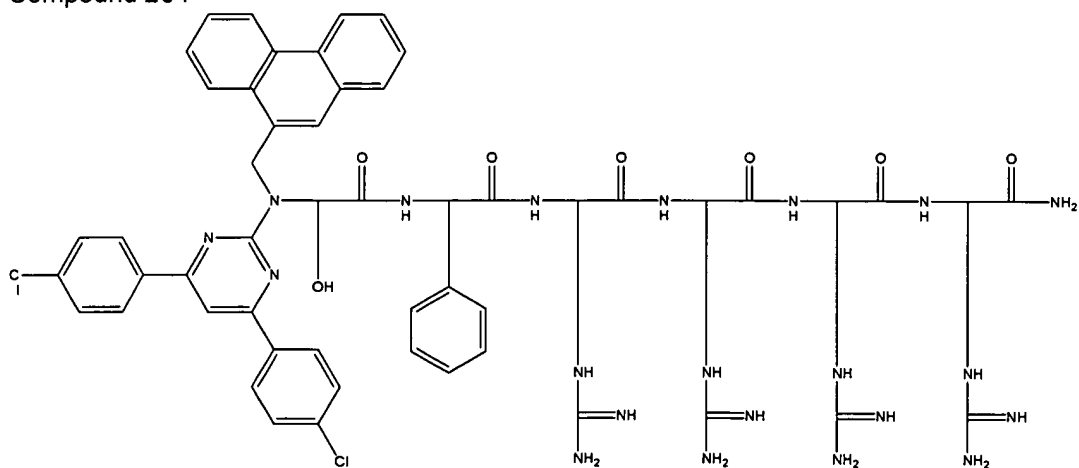
Compound 202



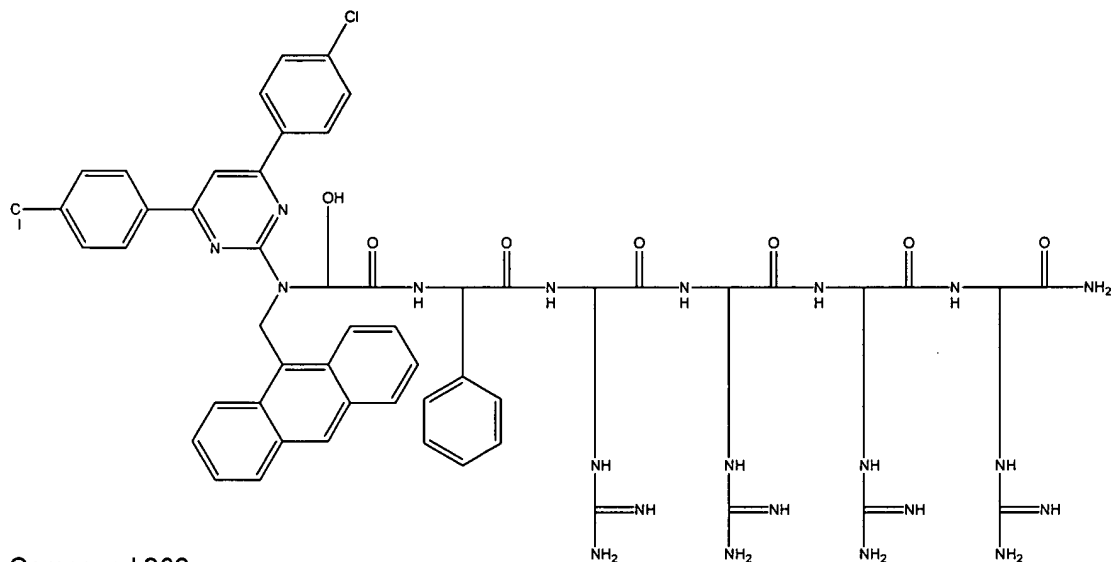
Compound 203



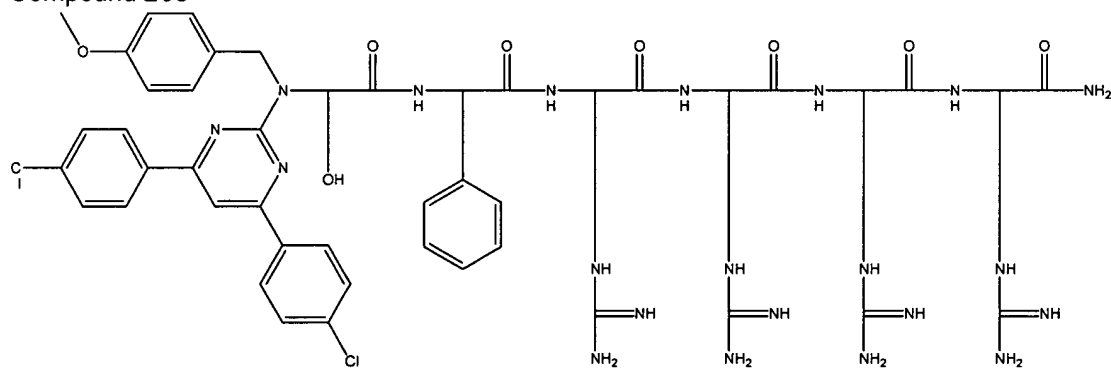
Compound 204



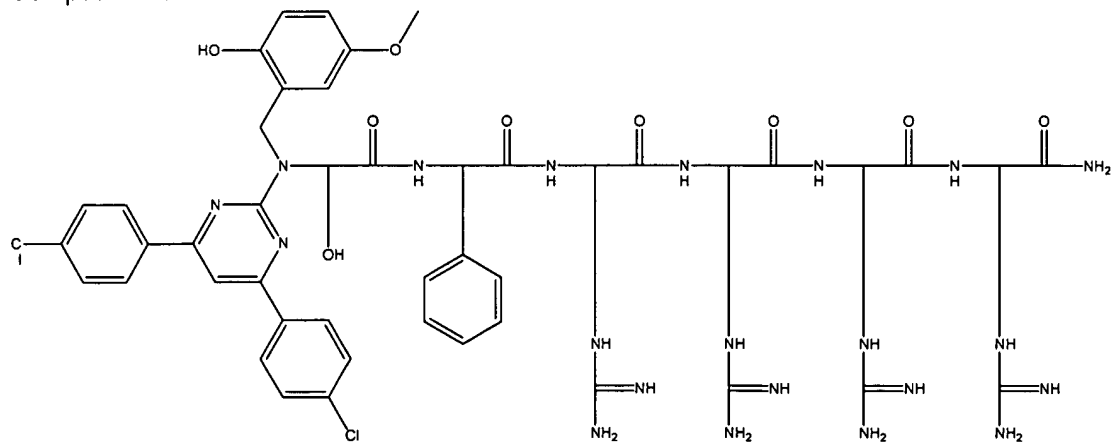
Compound 205



Compound 206



Compound 207



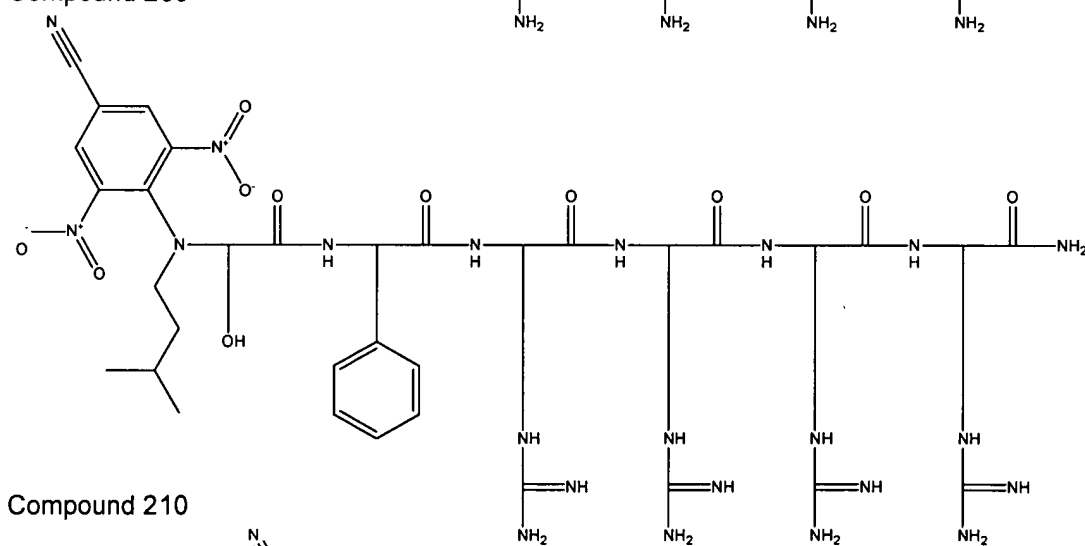
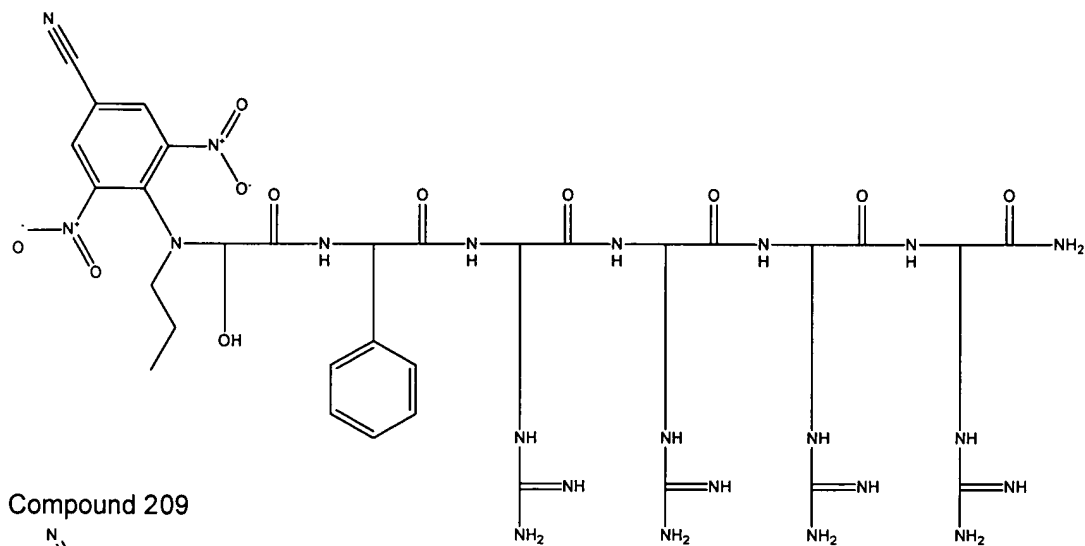
Compound 208

Applicant: David S. Lawrence

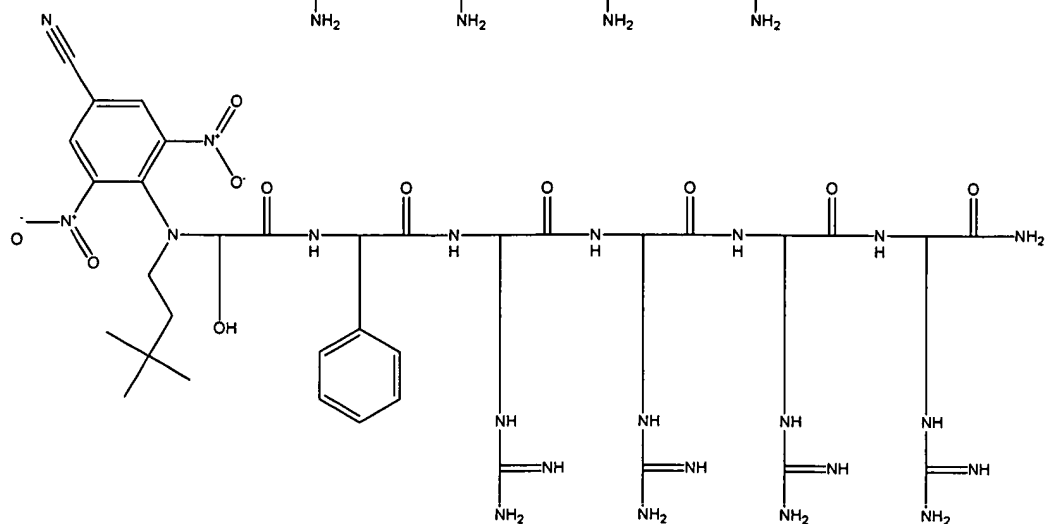
Serial No.: 10/755,086

Filed: January 9, 2004

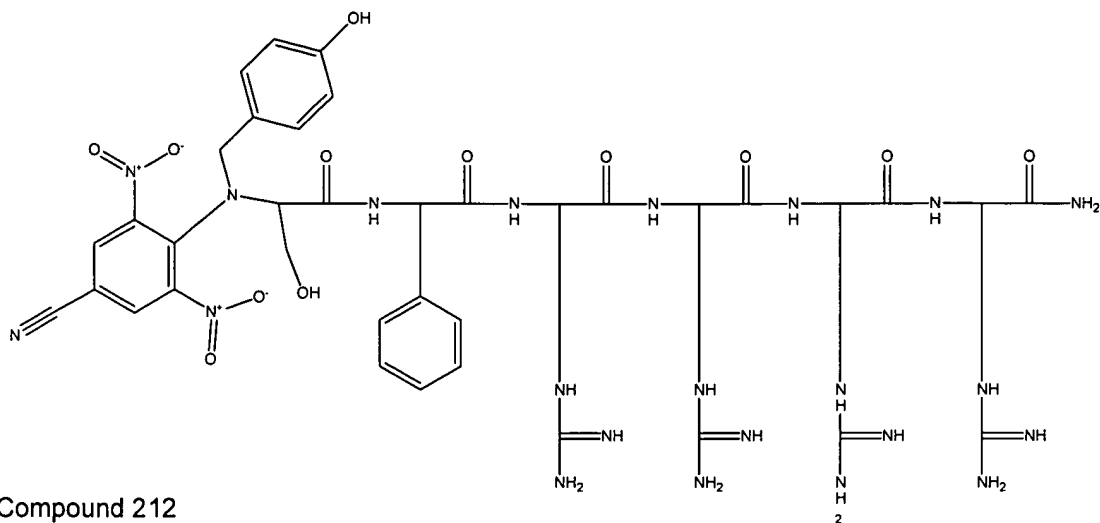
page 88 of 190



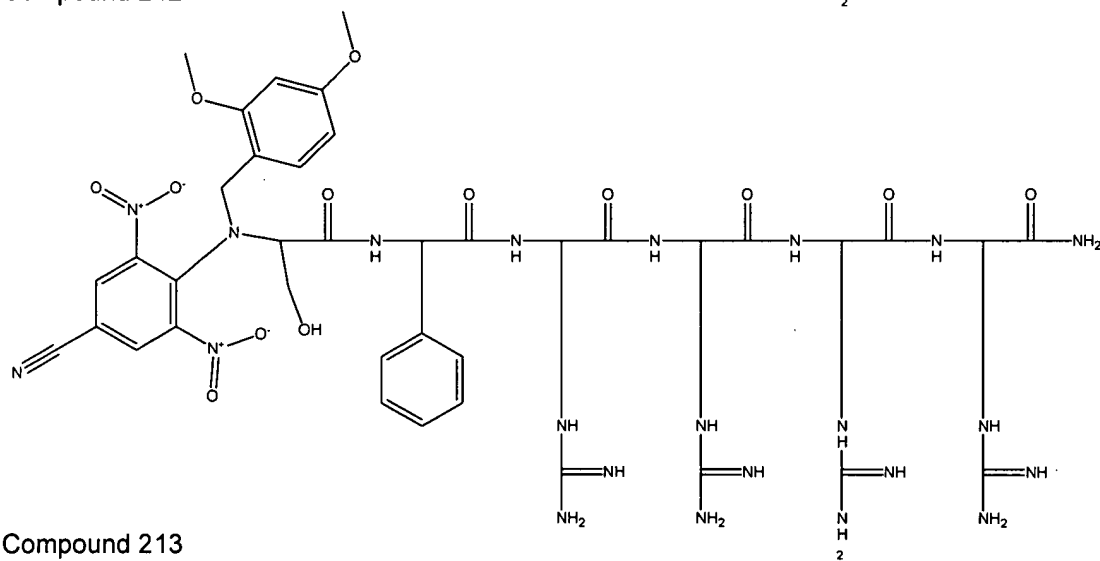
Compound 211



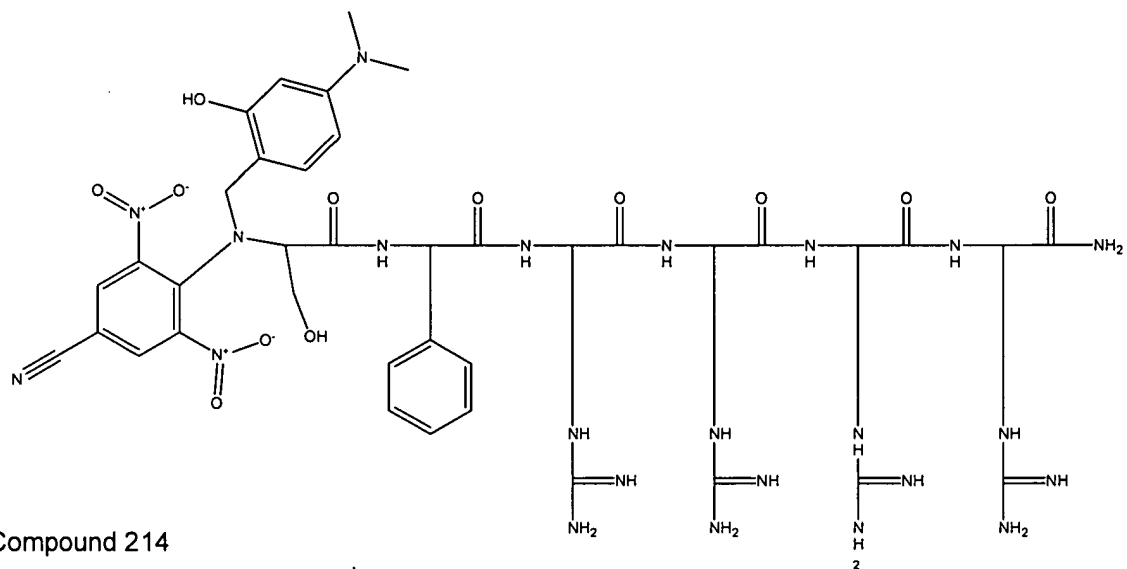
Applicant: David S. Lawrence
Serial No.: 10/755,086
Filed: January 9, 2004
page 89 of 190



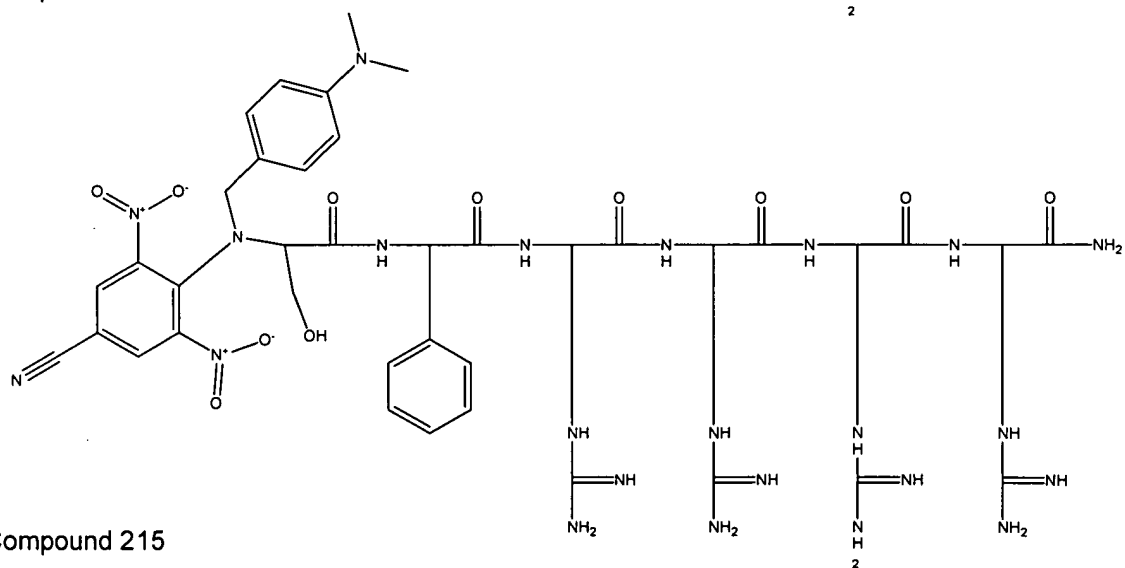
Compound 212



Compound 213

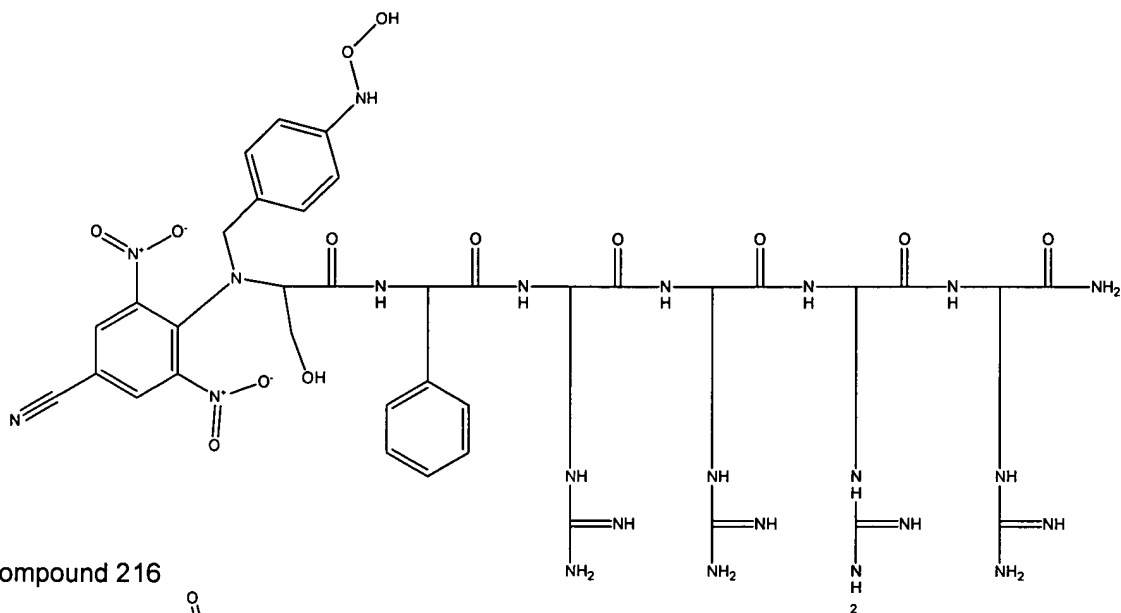


Compound 214

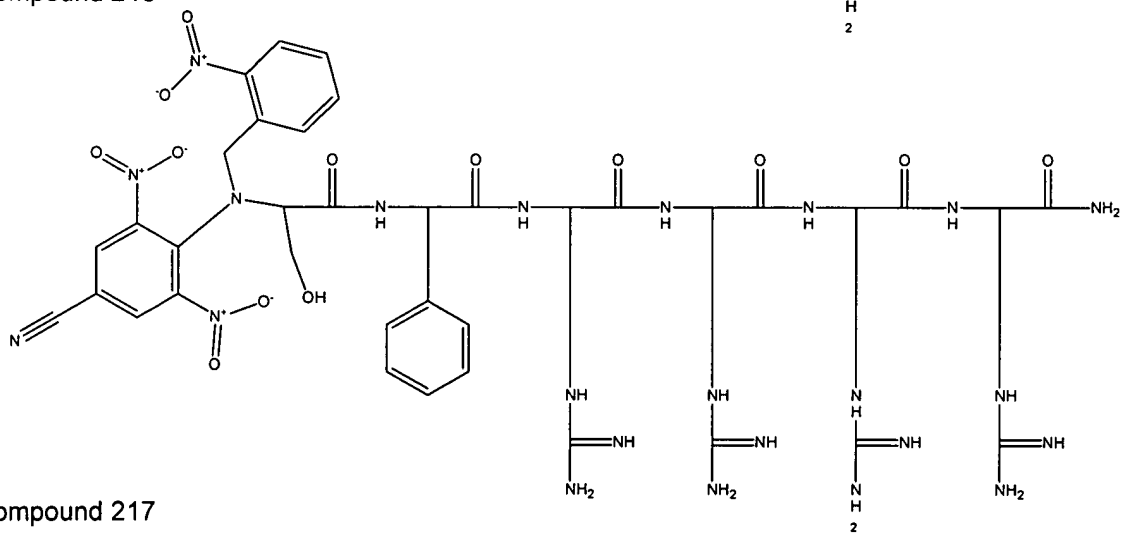


Compound 215

418197.1

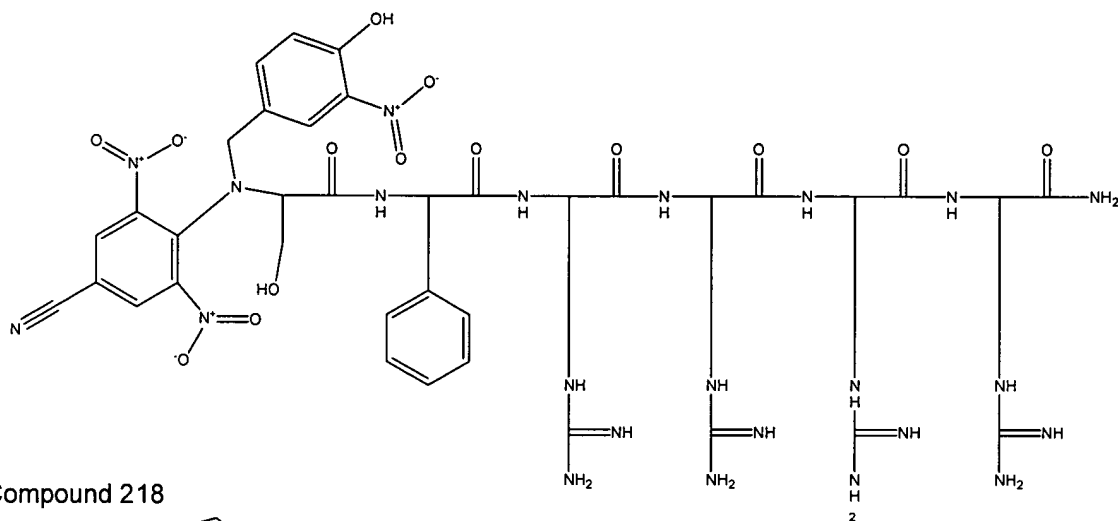


Compound 216

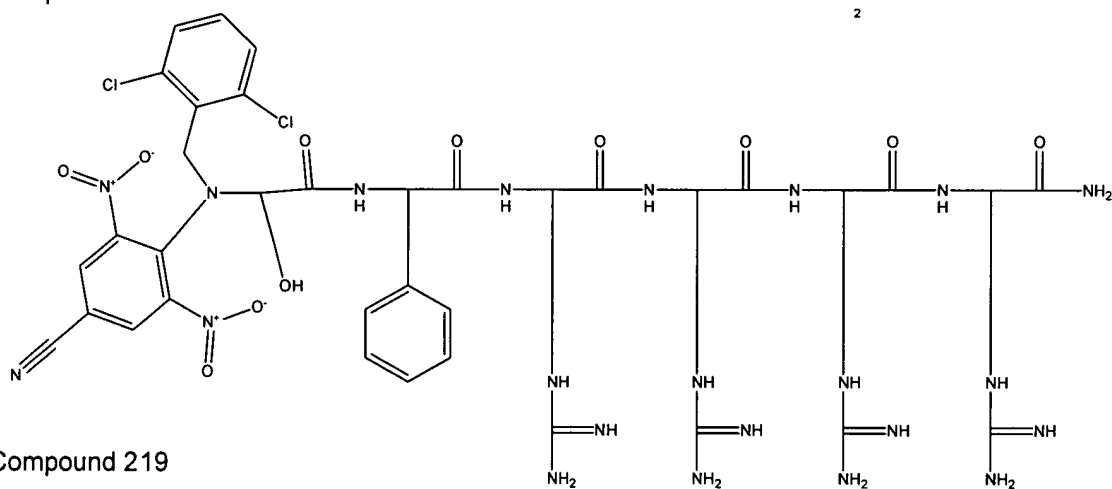


Compound 217

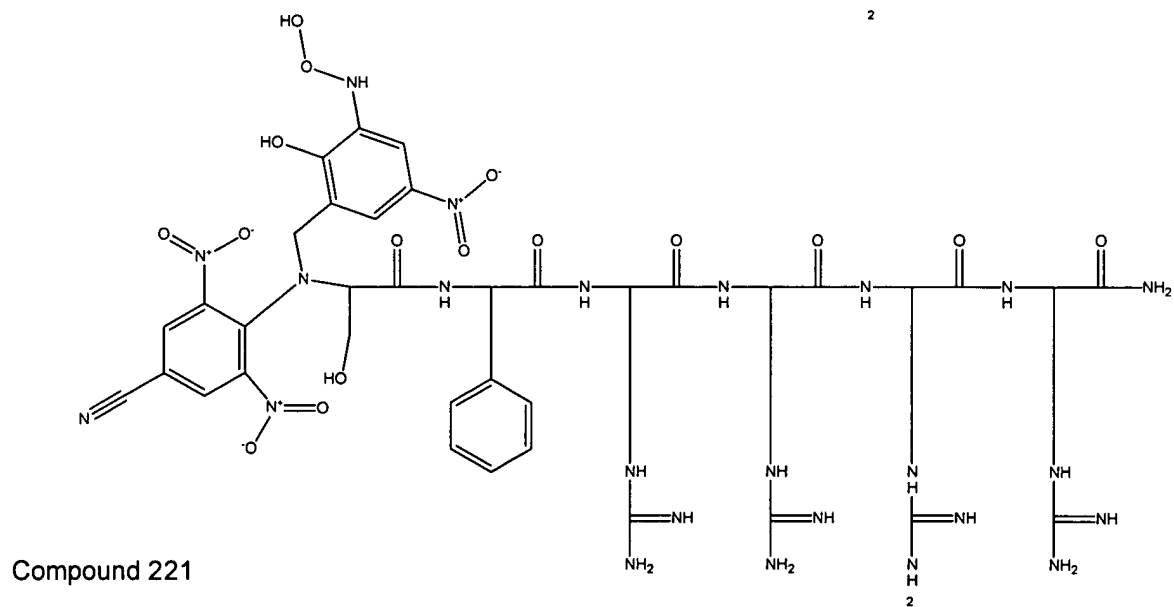
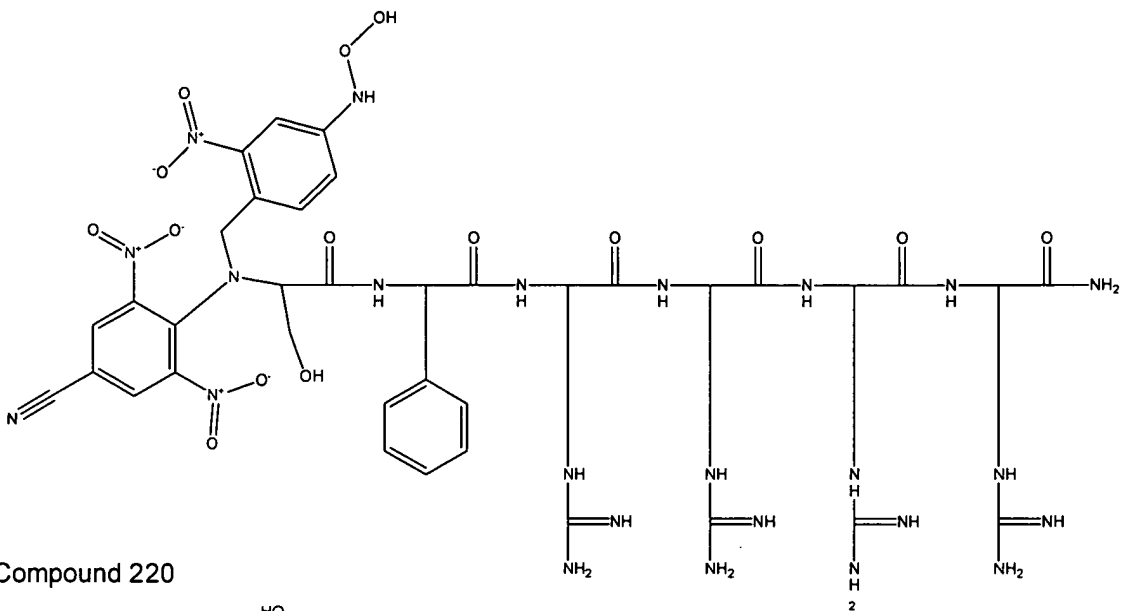
Applicant: David S. Lawrence
 Serial No.: 10/755,086
 Filed: January 9, 2004
 page 92 of 190

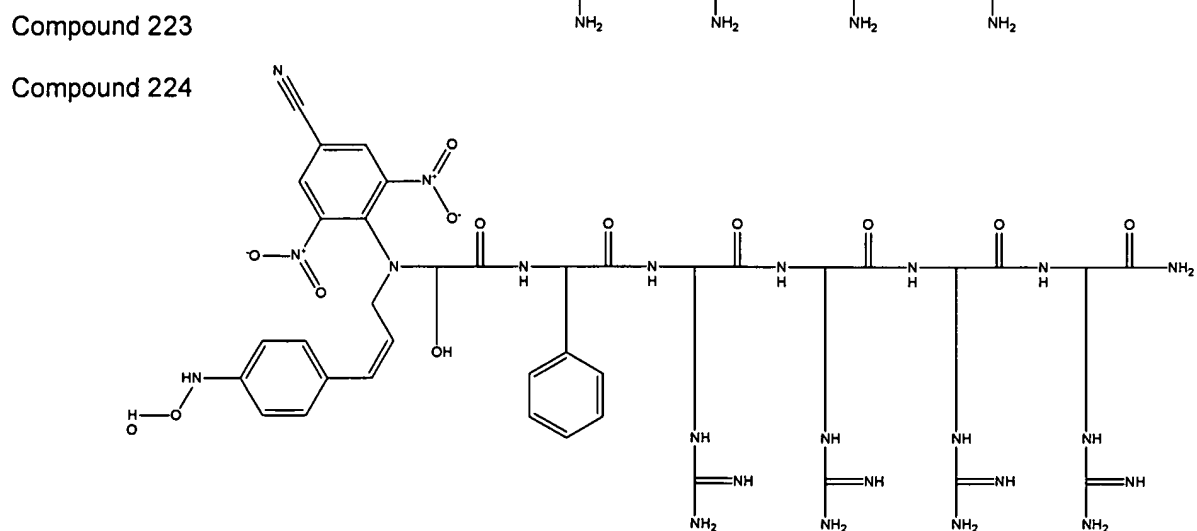
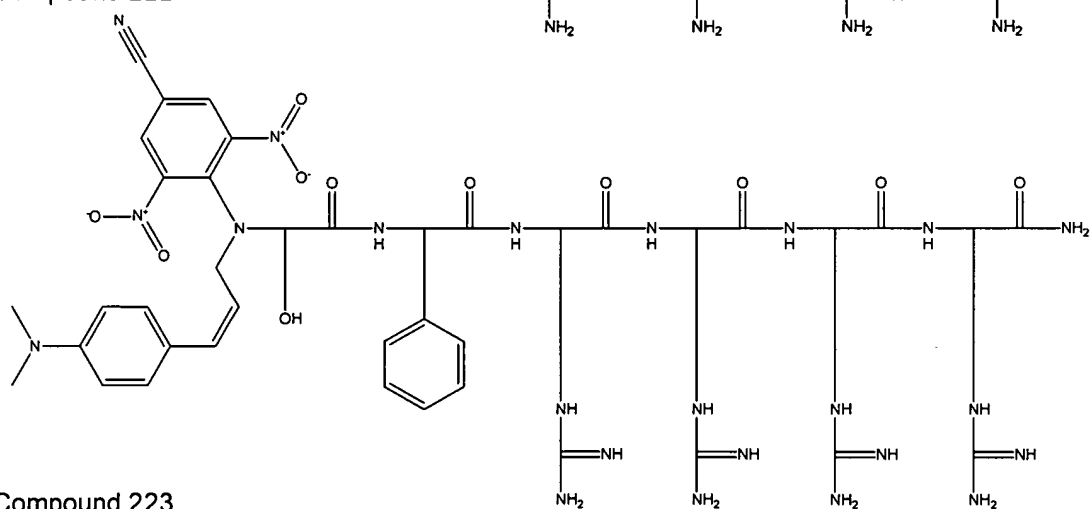
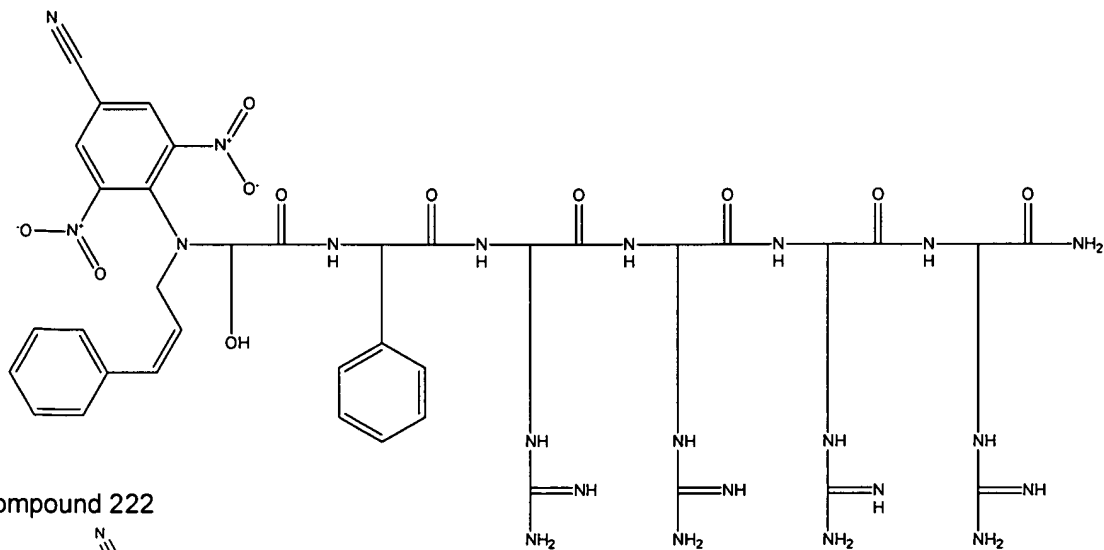


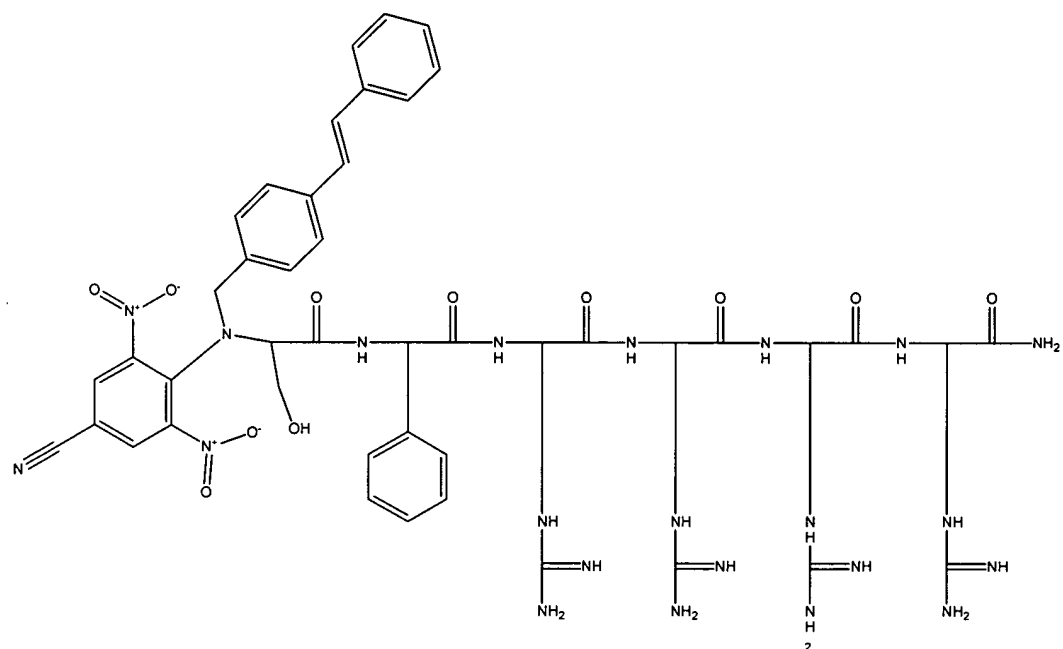
Compound 218



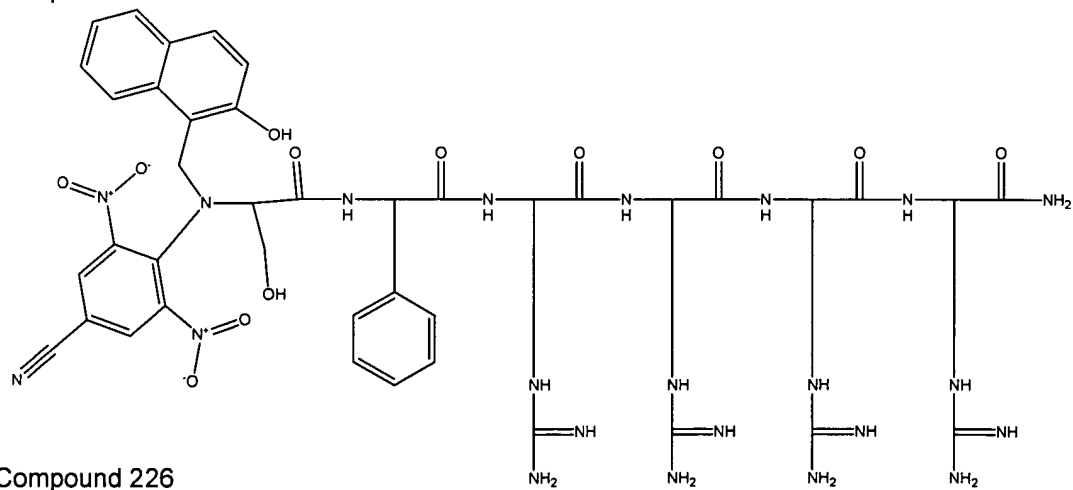
Compound 219



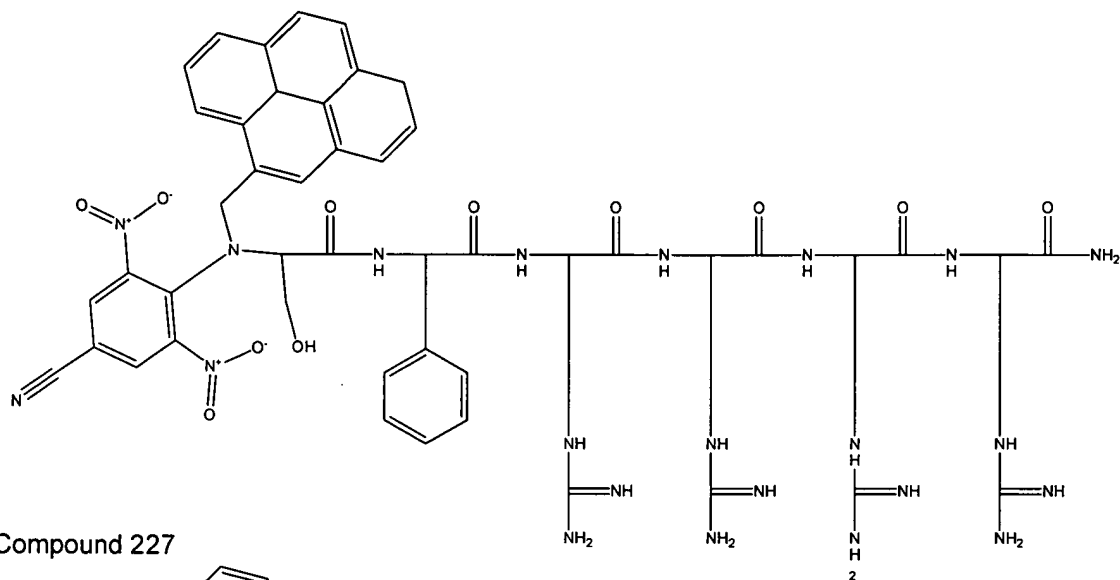




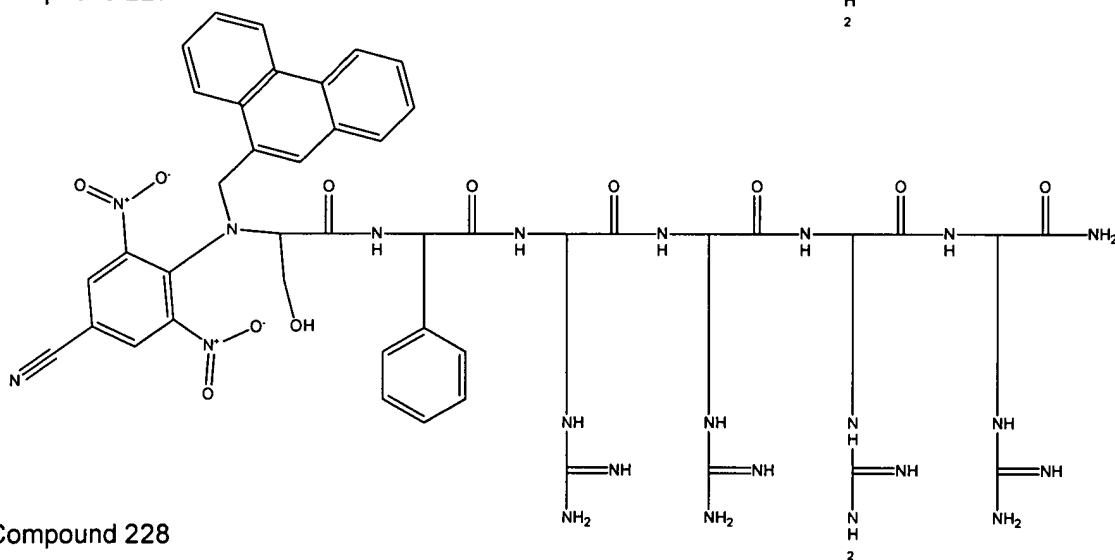
Compound 225



Compound 226

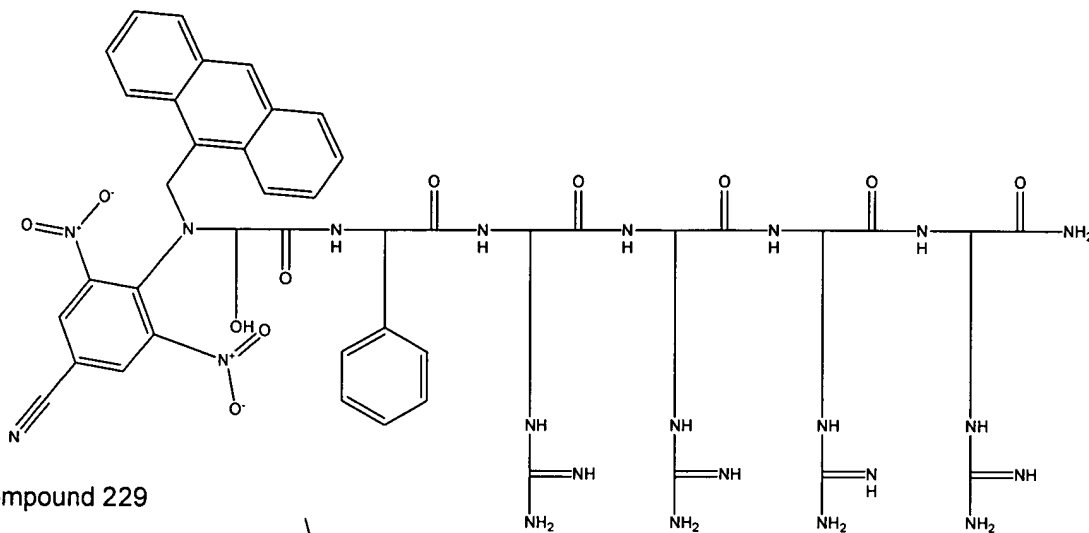


Compound 227

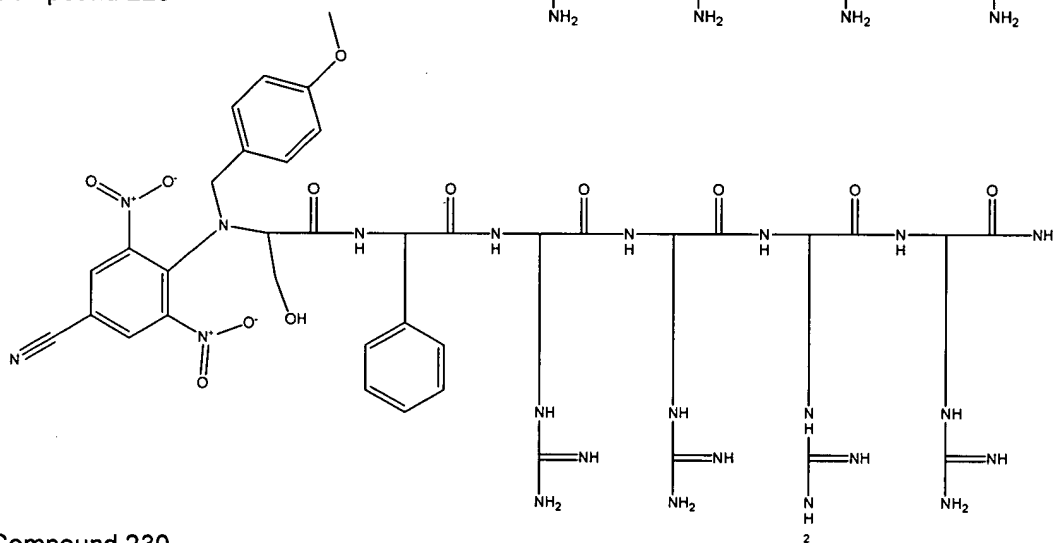


Compound 228

Applicant: David S. Lawrence
Serial No.: 10/755,086
Filed: January 9, 2004
page 97 of 190



Compound 229



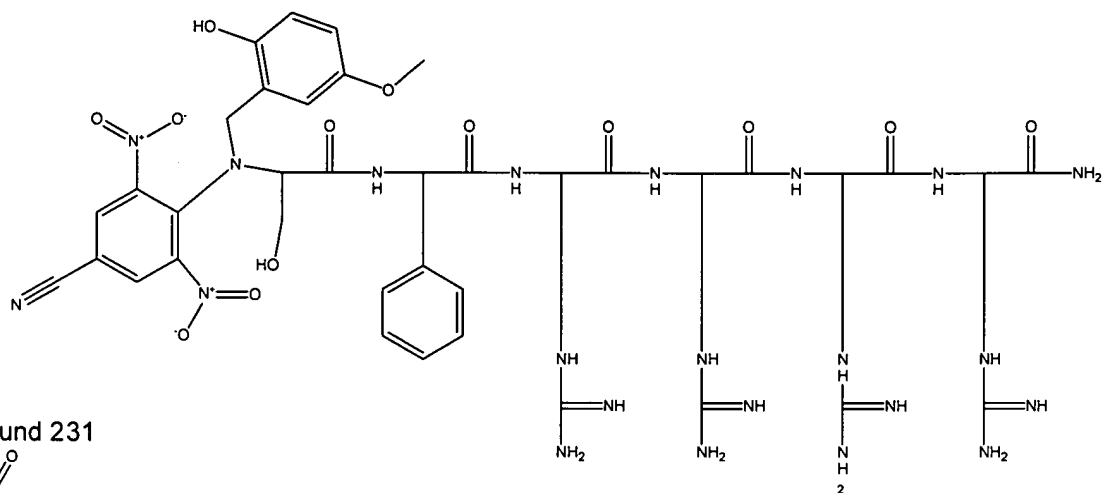
Compound 230

Applicant: David S. Lawrence

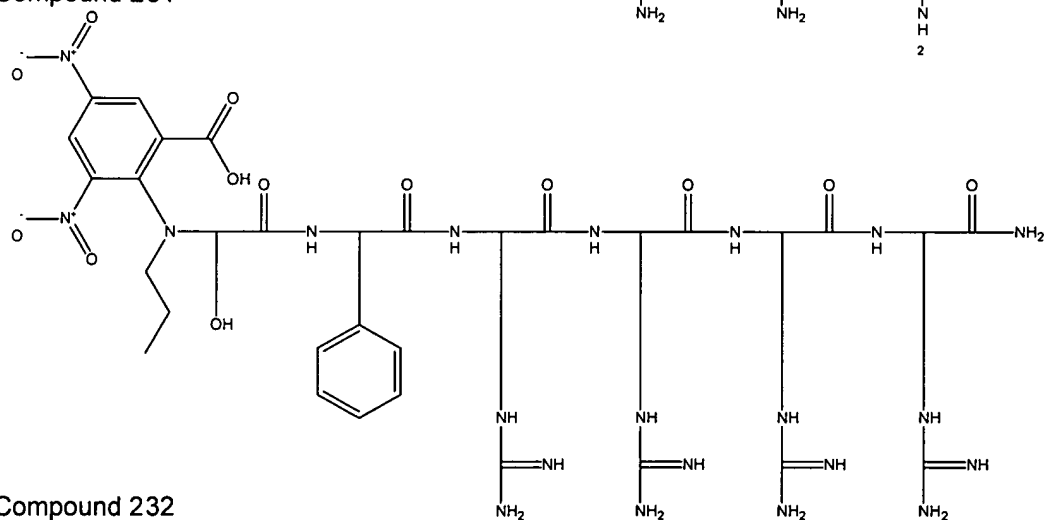
Serial No.: 10/755,086

Filed: January 9, 2004

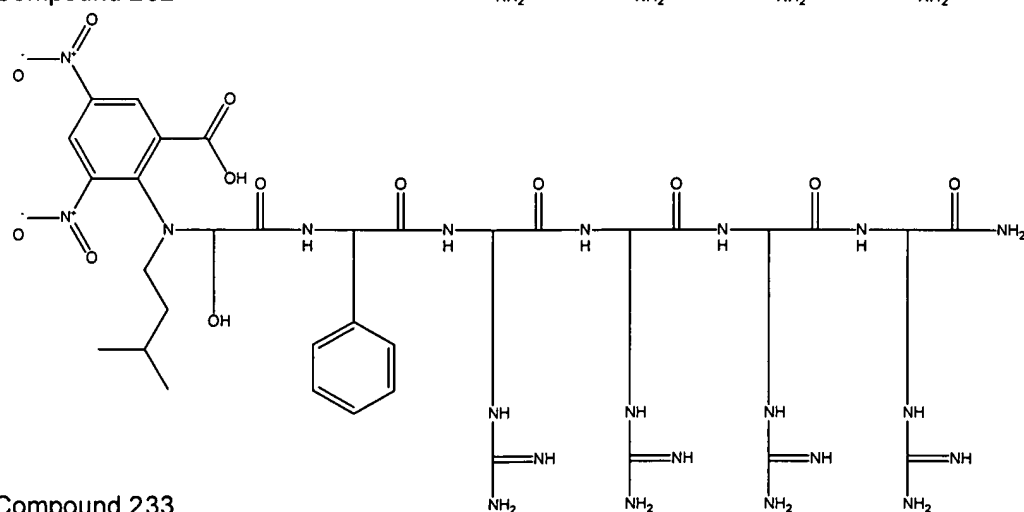
page 98 of 190



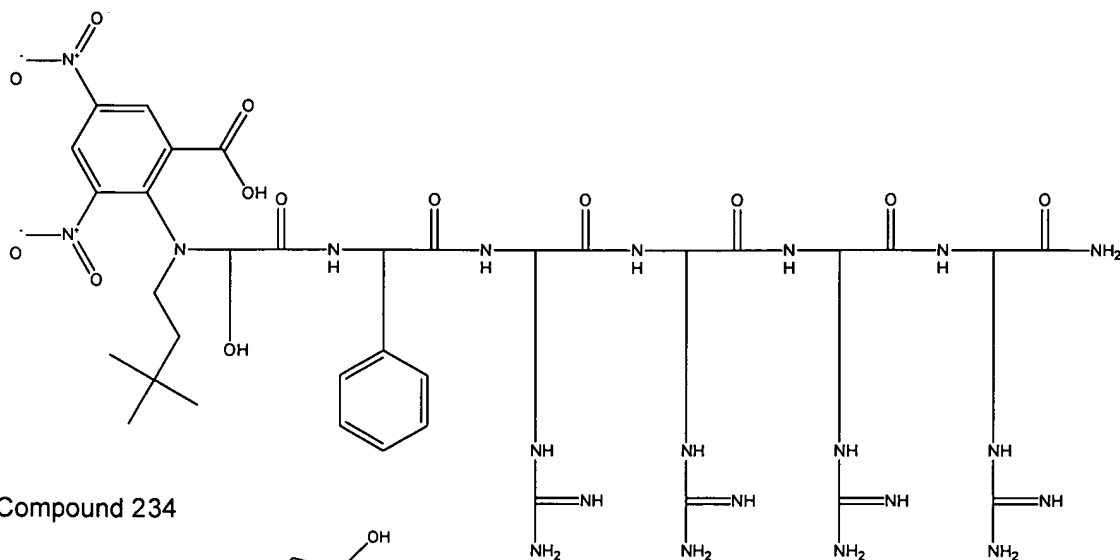
Compound 231



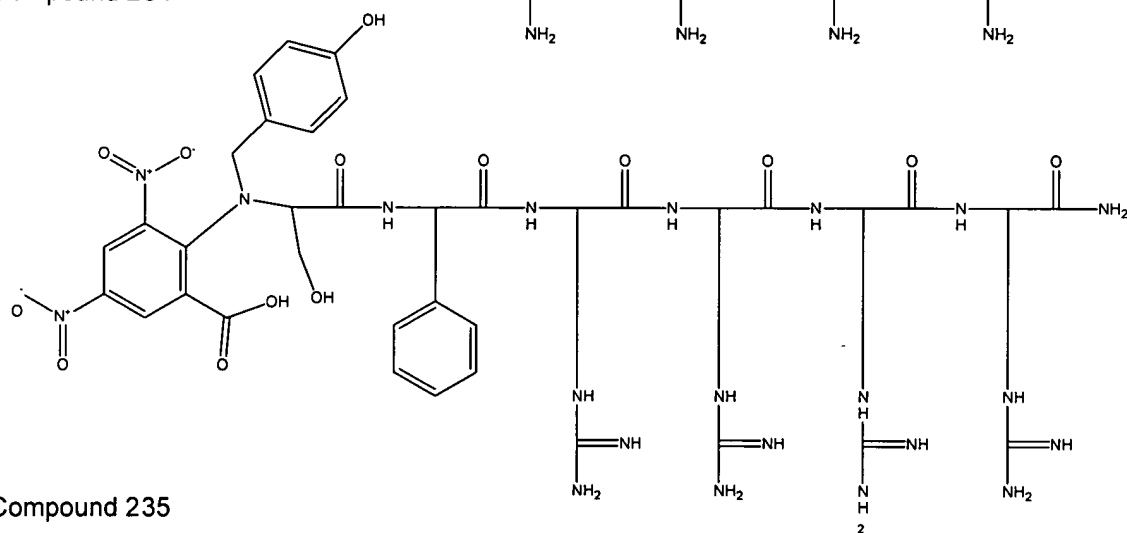
Compound 232



Compound 233

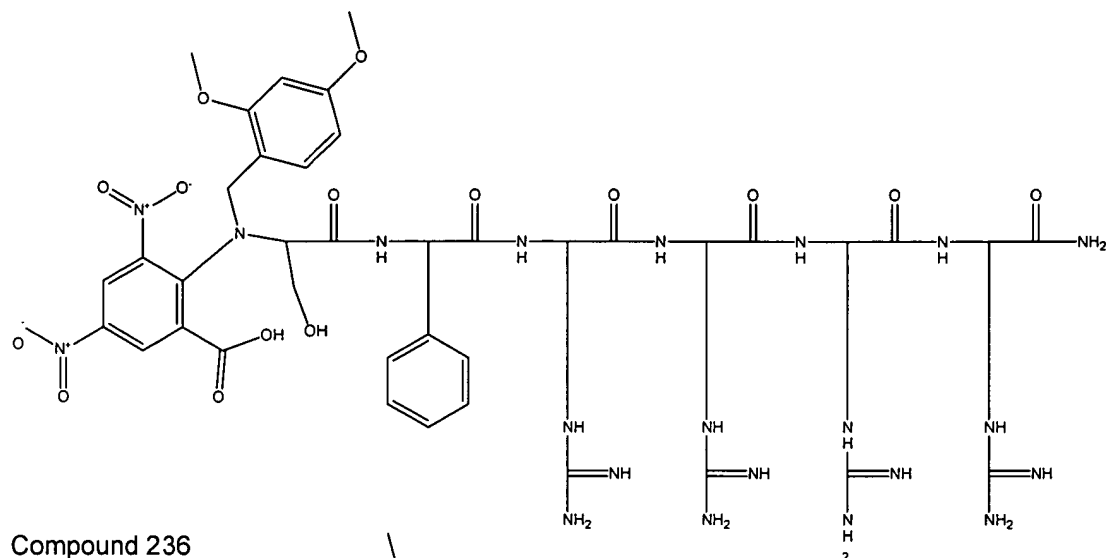


Compound 234

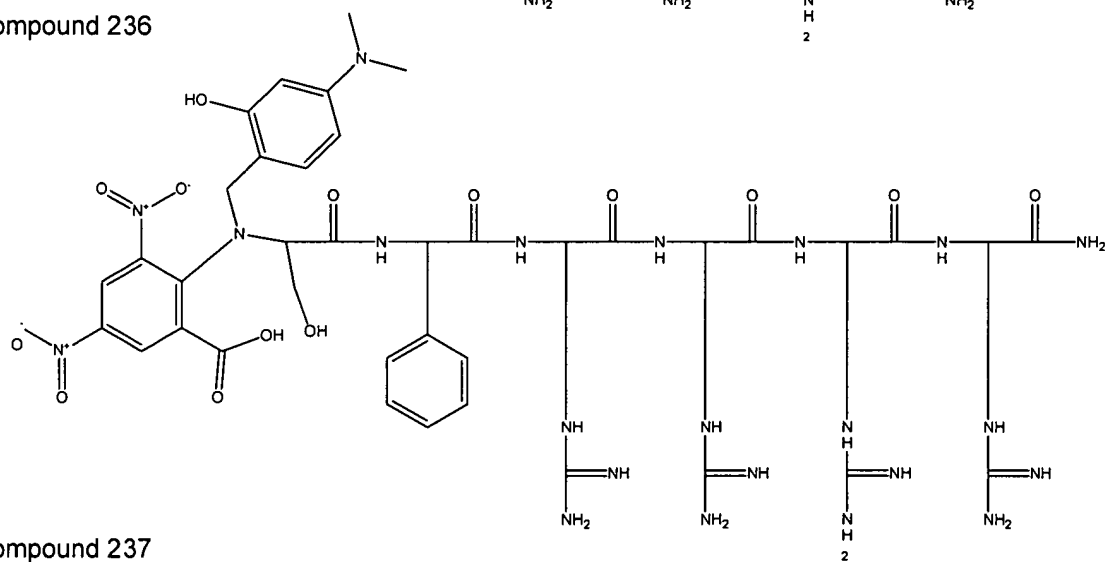


Compound 235

Applicant: David S. Lawrence
Serial No.: 10/755,086
Filed: January 9, 2004
page 100 of 190

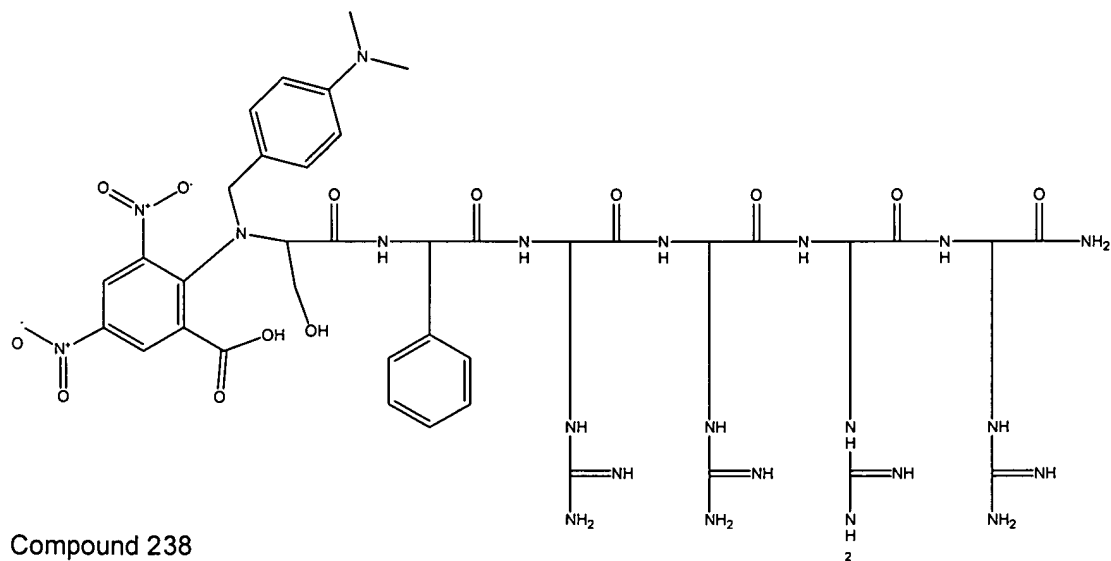


Compound 236

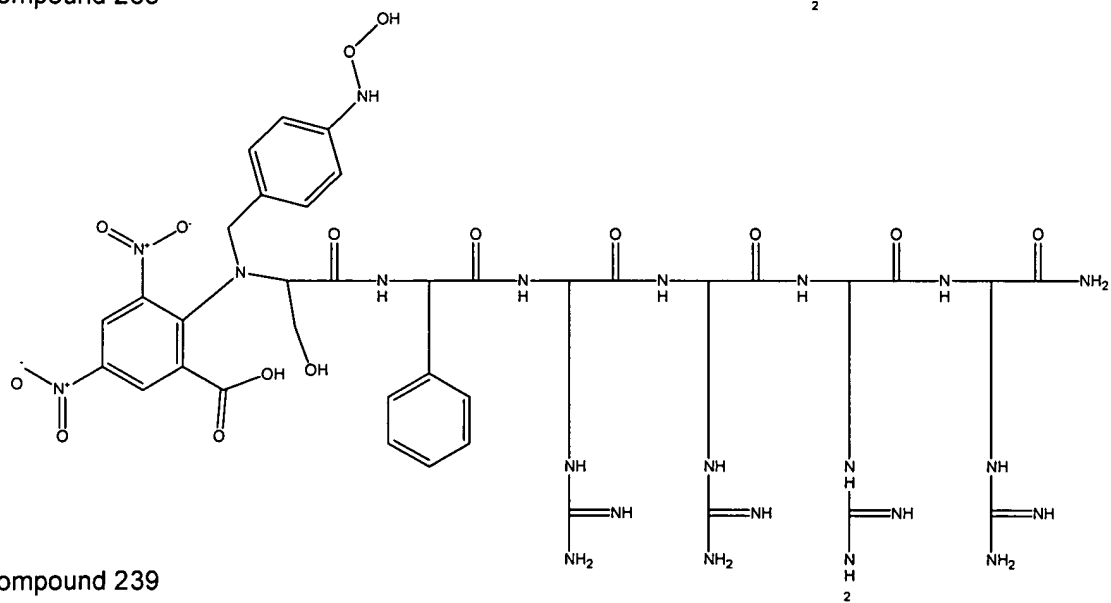


Compound 237

Applicant: David S. Lawrence
Serial No.: 10/755,086
Filed: January 9, 2004
page 101 of 190

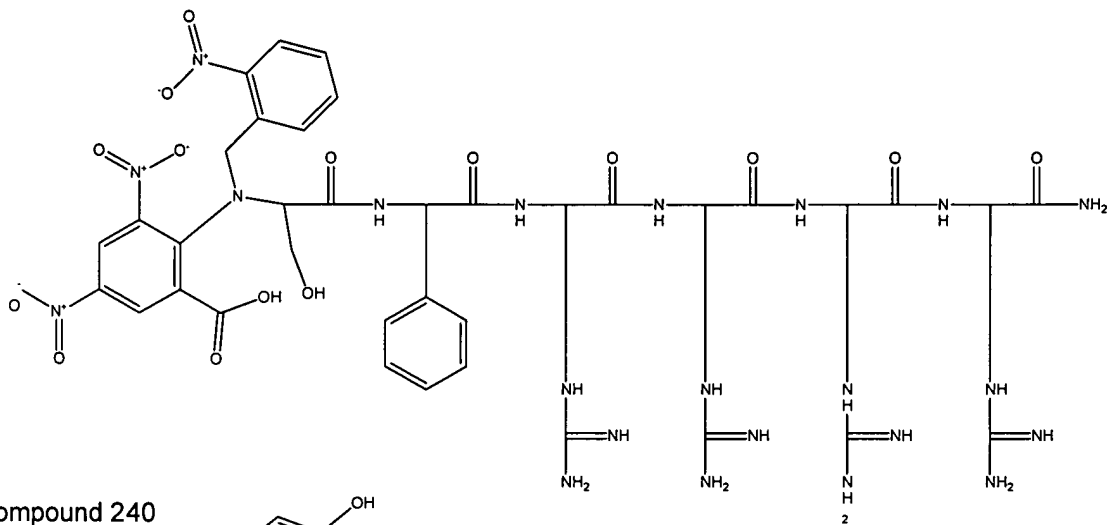


Compound 238

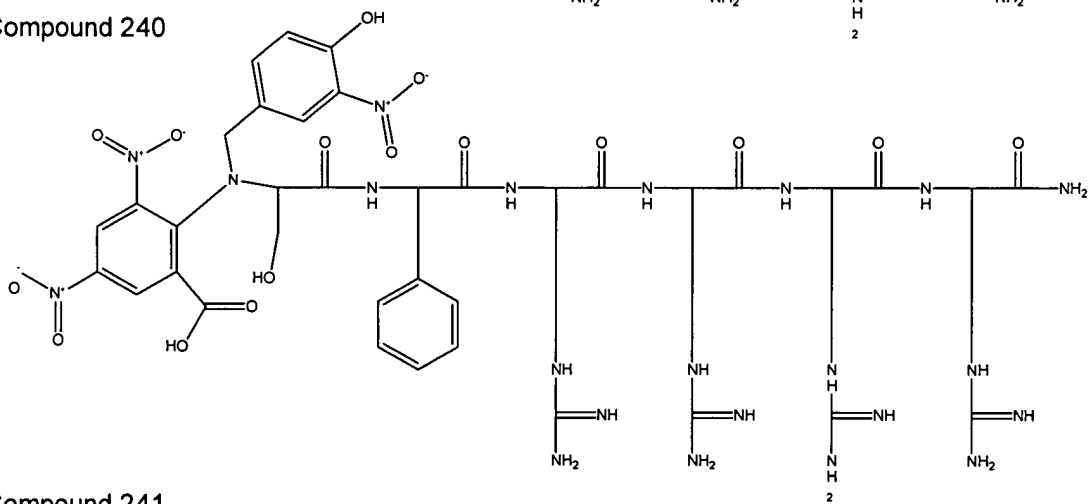


Compound 239

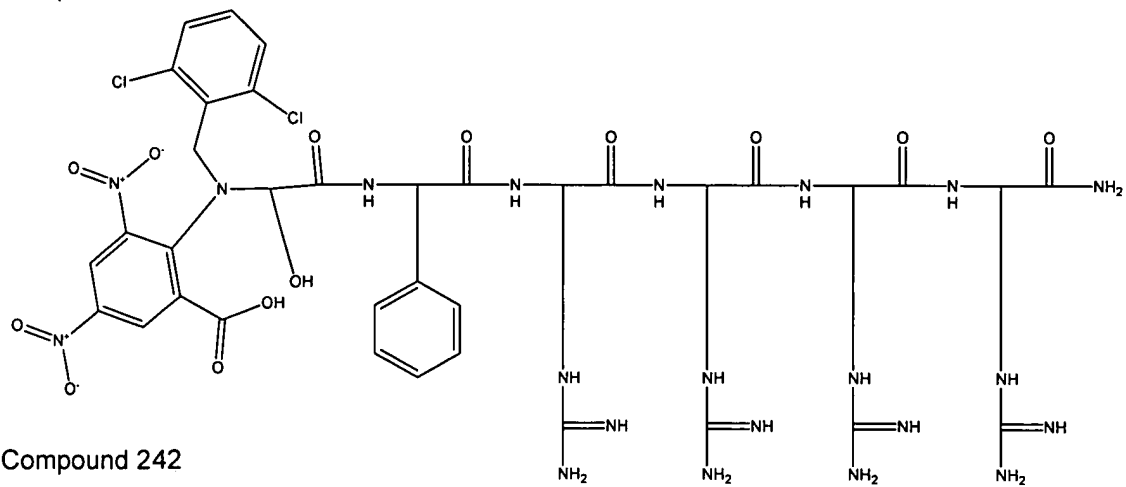
page 102 of 190



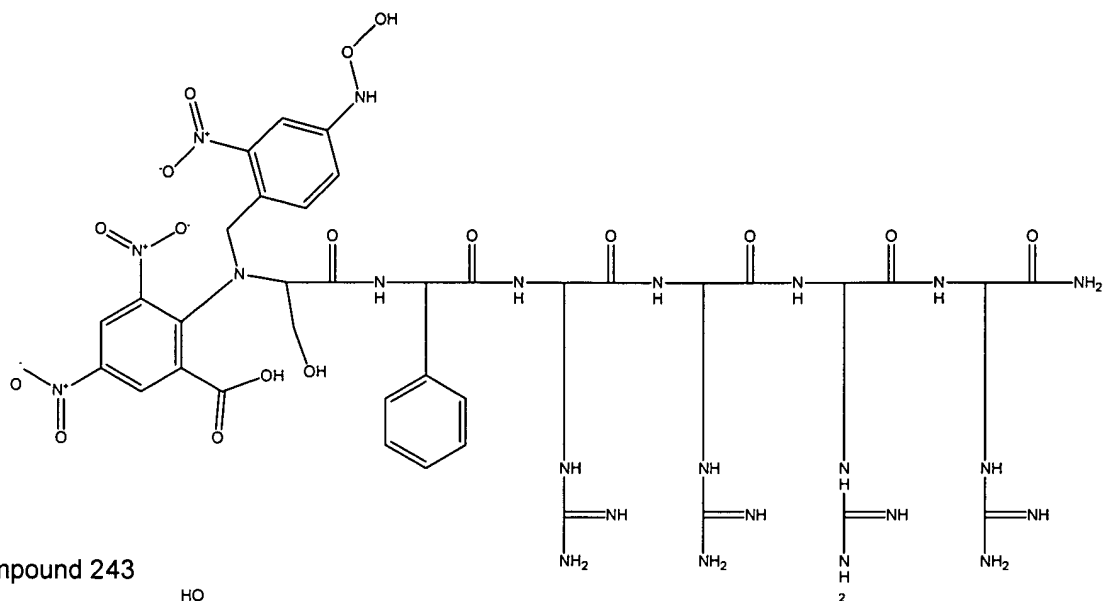
Compound 240



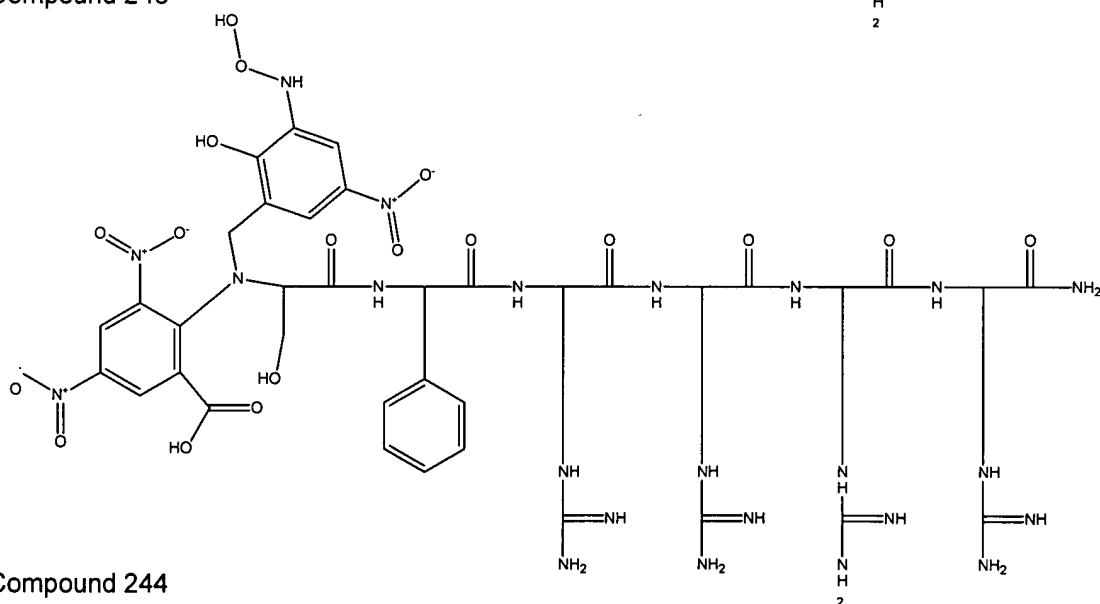
Compound 241



Compound 242

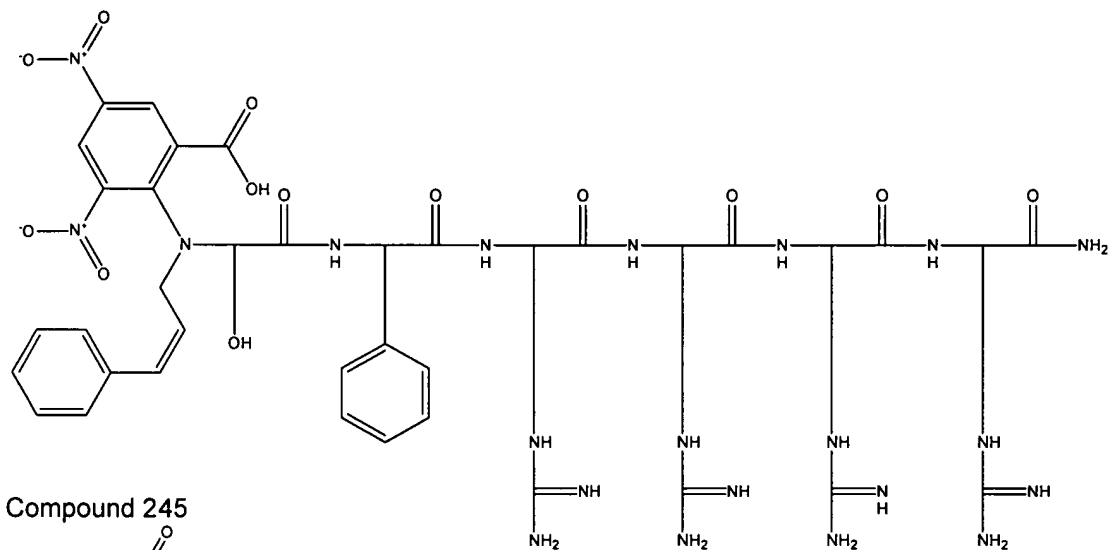


Compound 243

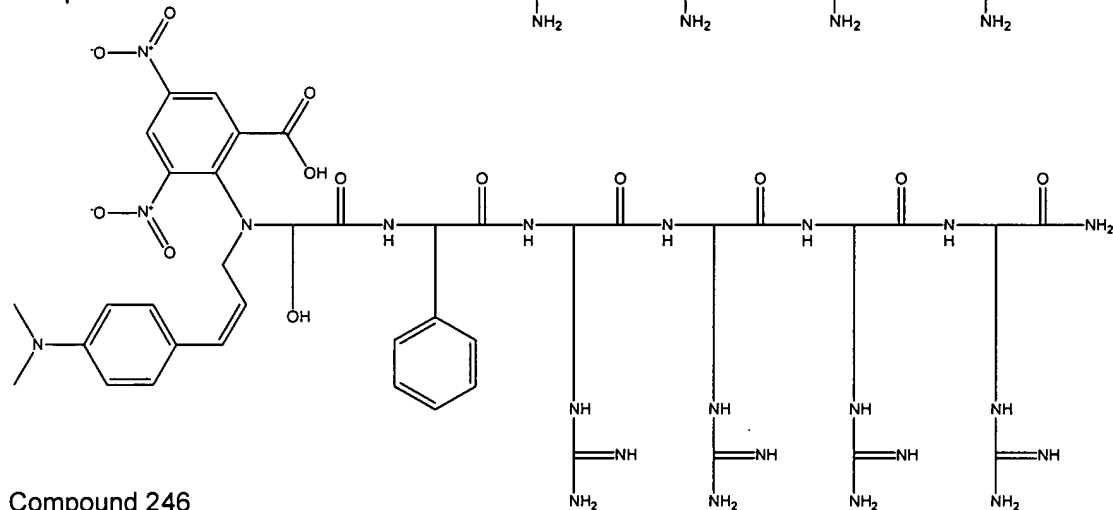


Compound 244

Applicant: David S. Lawrence
Serial No.: 10/755,086
Filed: January 9, 2004
page 104 of 190

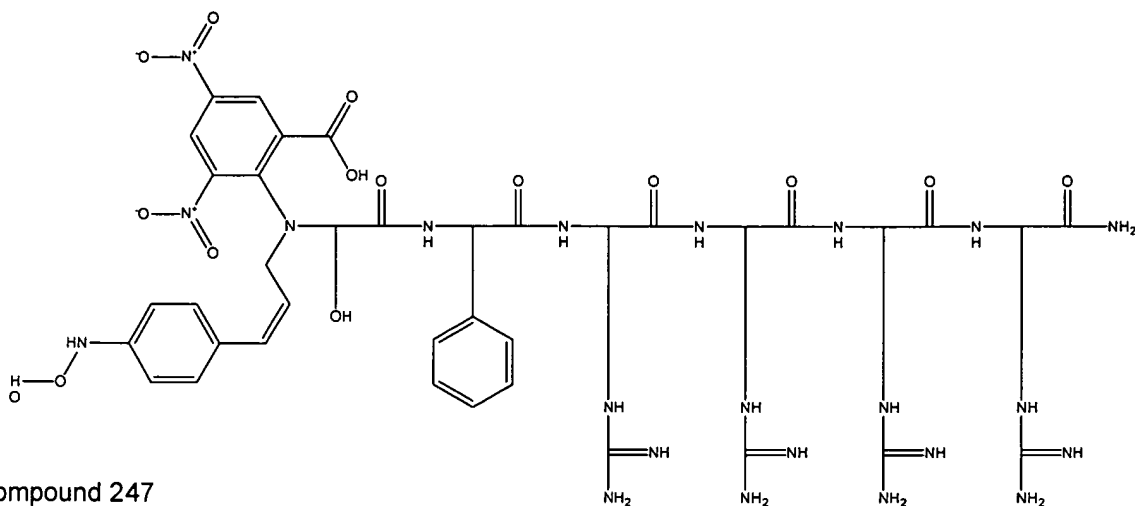


Compound 245

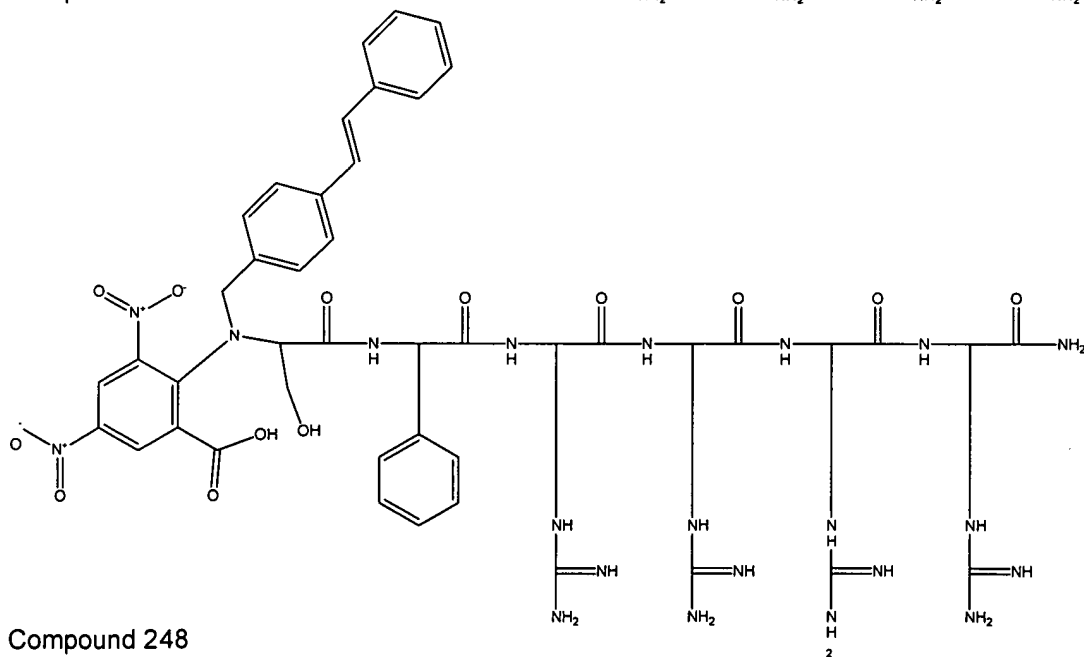


Compound 246

page 105 of 190

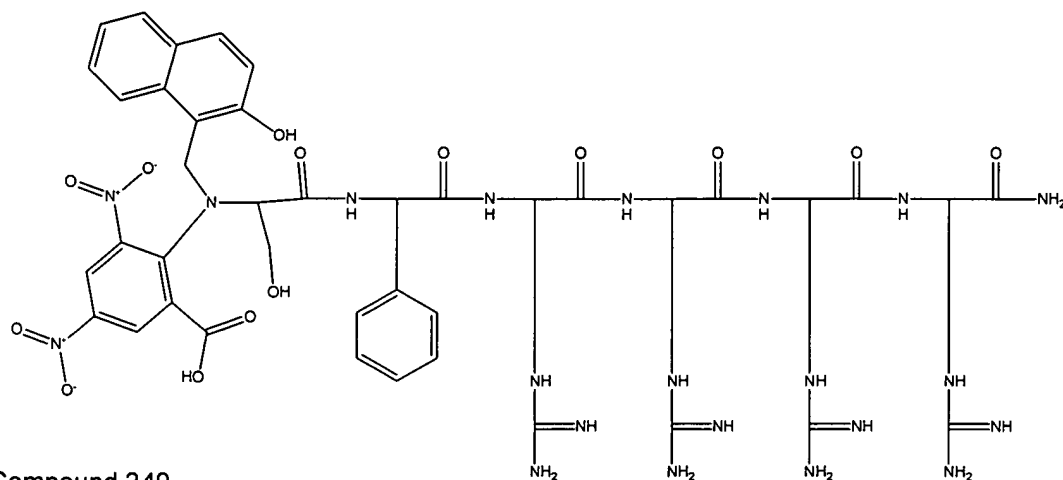


Compound 247

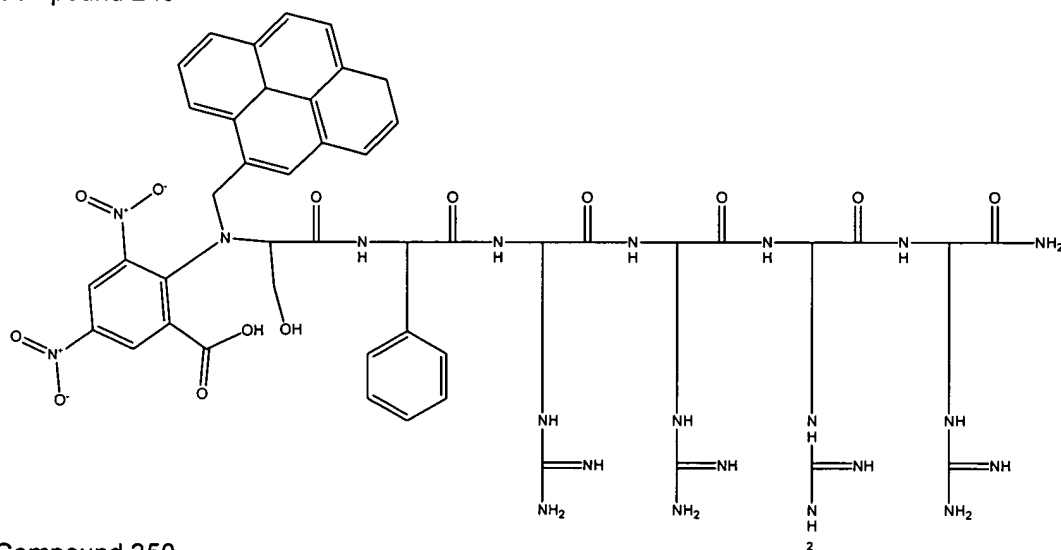


Compound 248

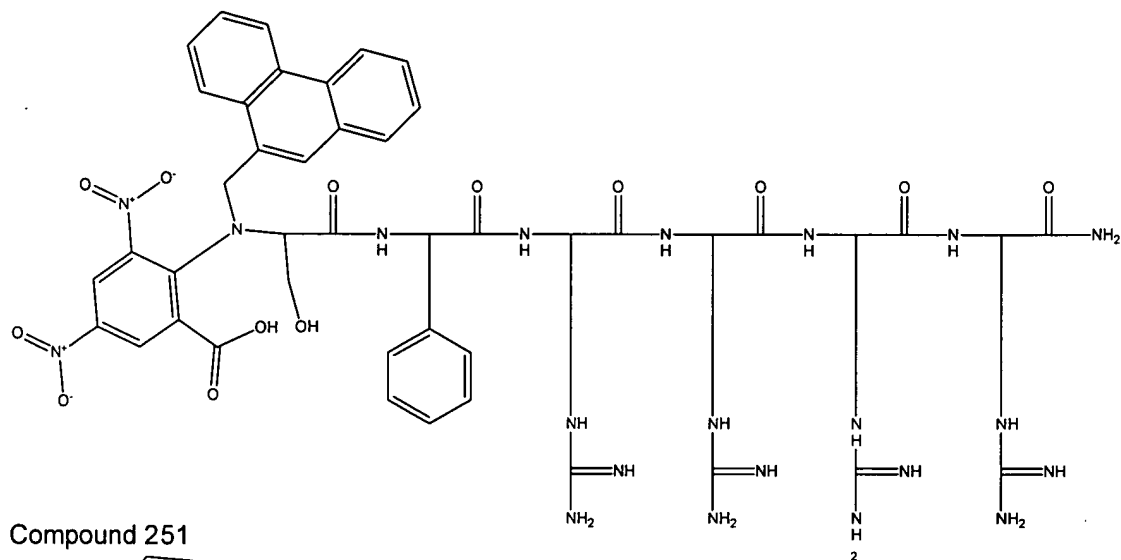
Applicant: David S. Lawrence
Serial No.: 10/755,086
Filed: January 9, 2004
page 106 of 190



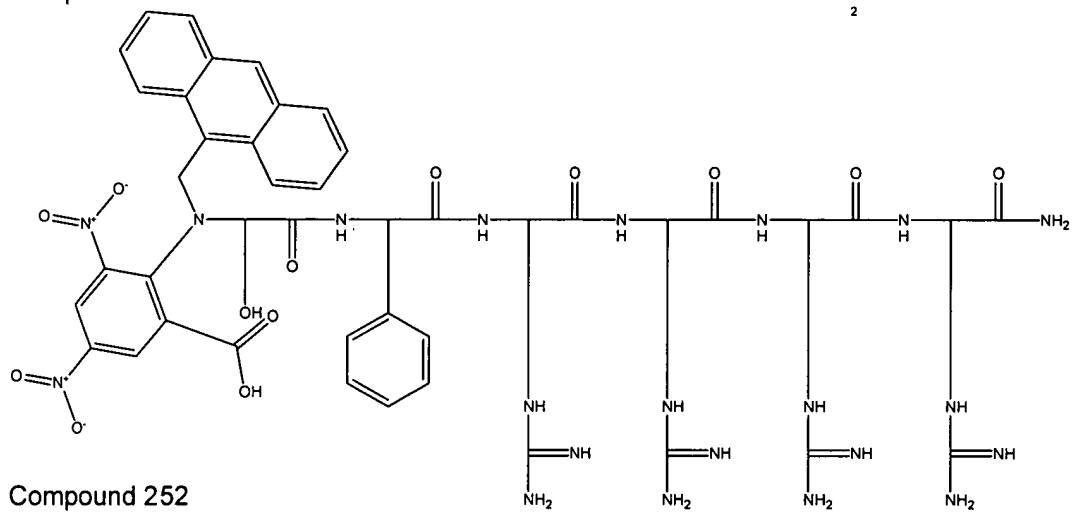
Compound 249



Compound 250

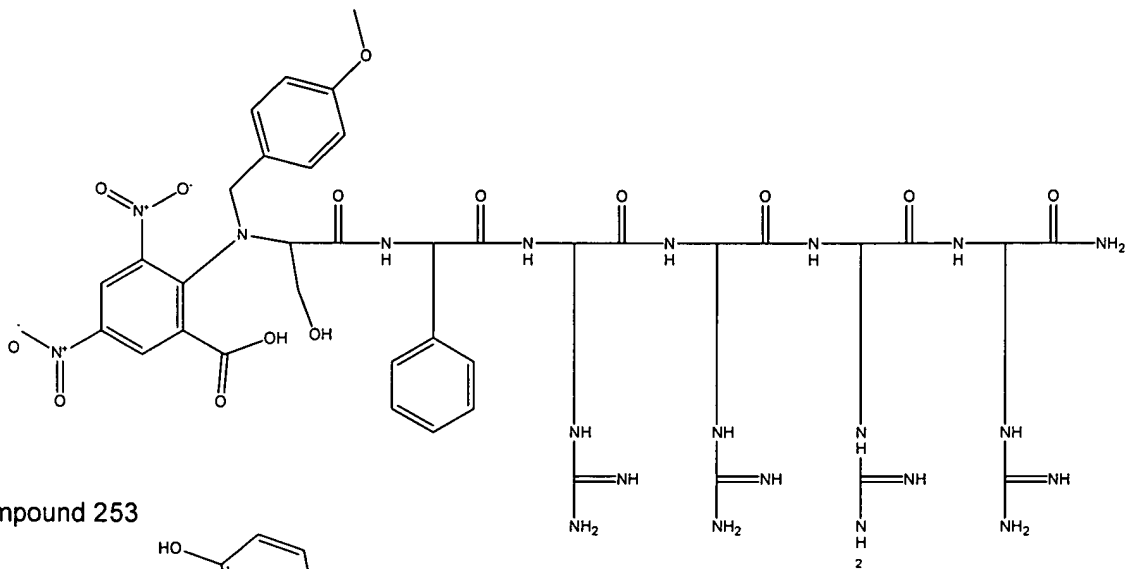


Compound 251

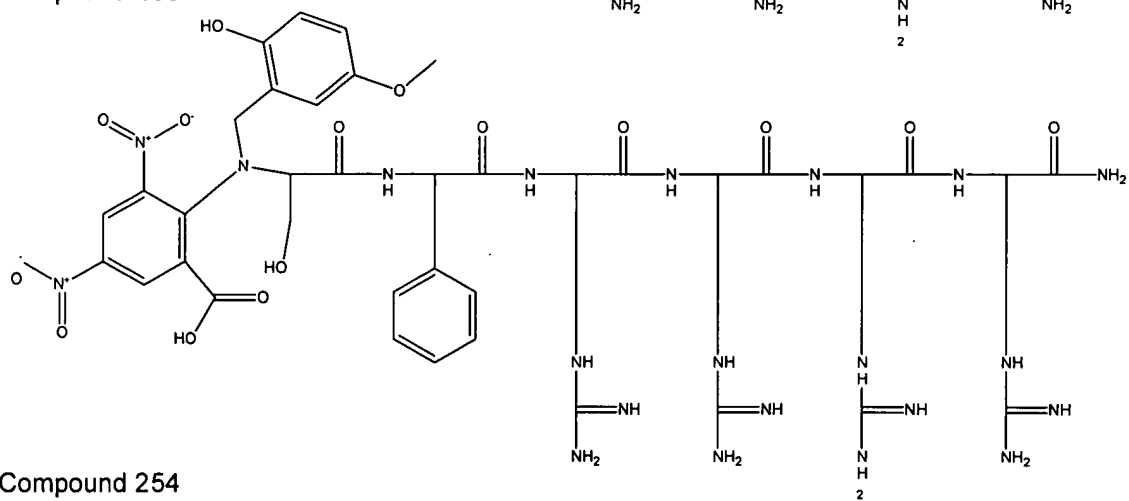


Compound 252

page 108 of 190

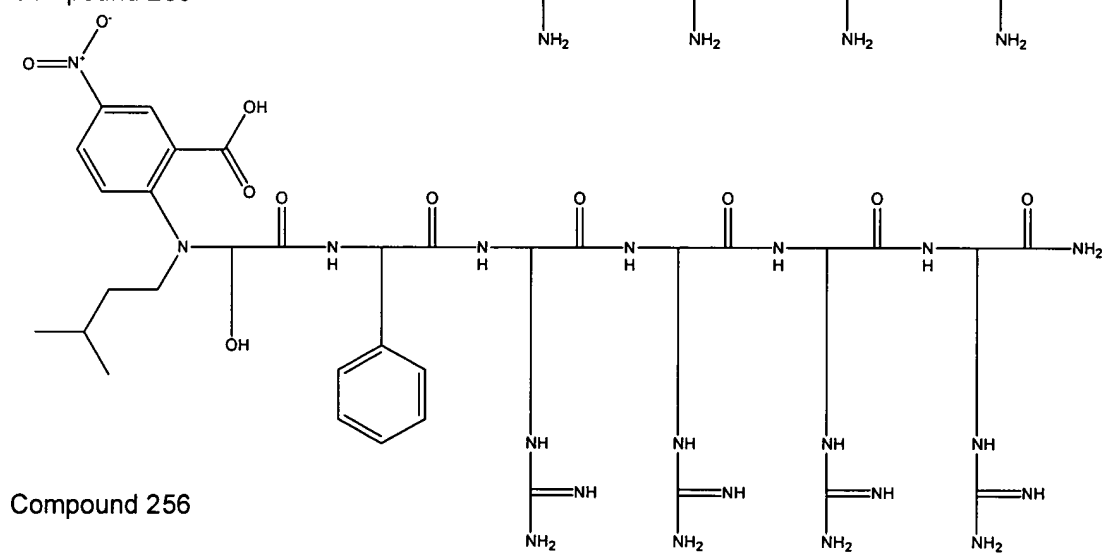
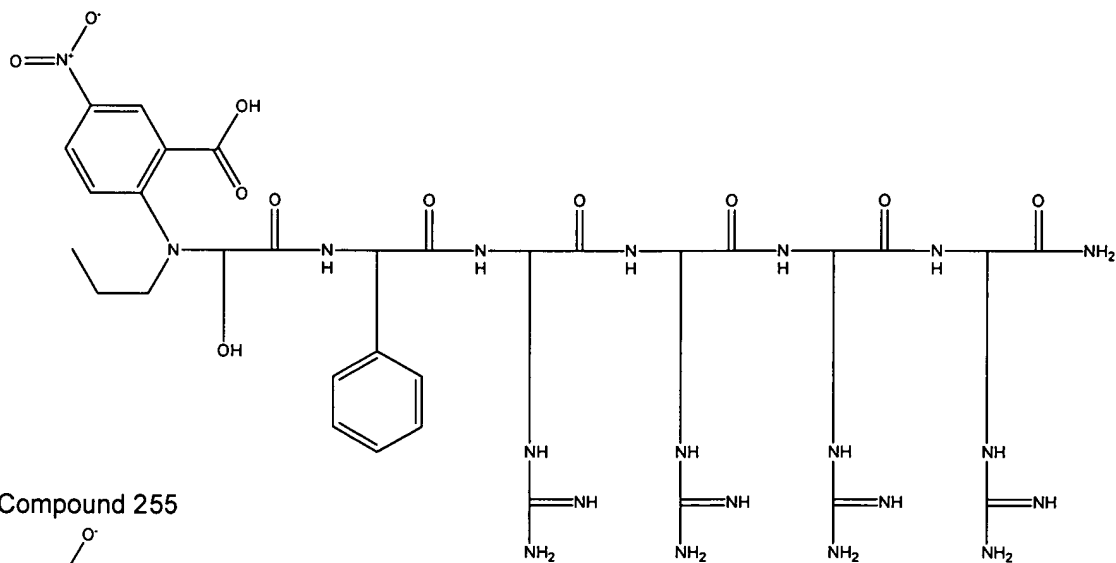


Compound 253

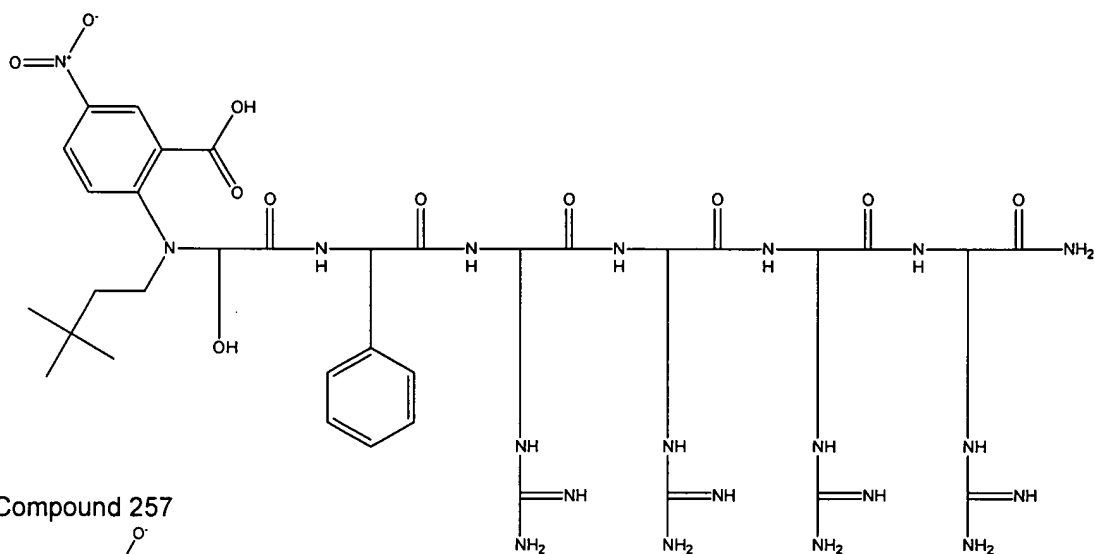


Compound 254

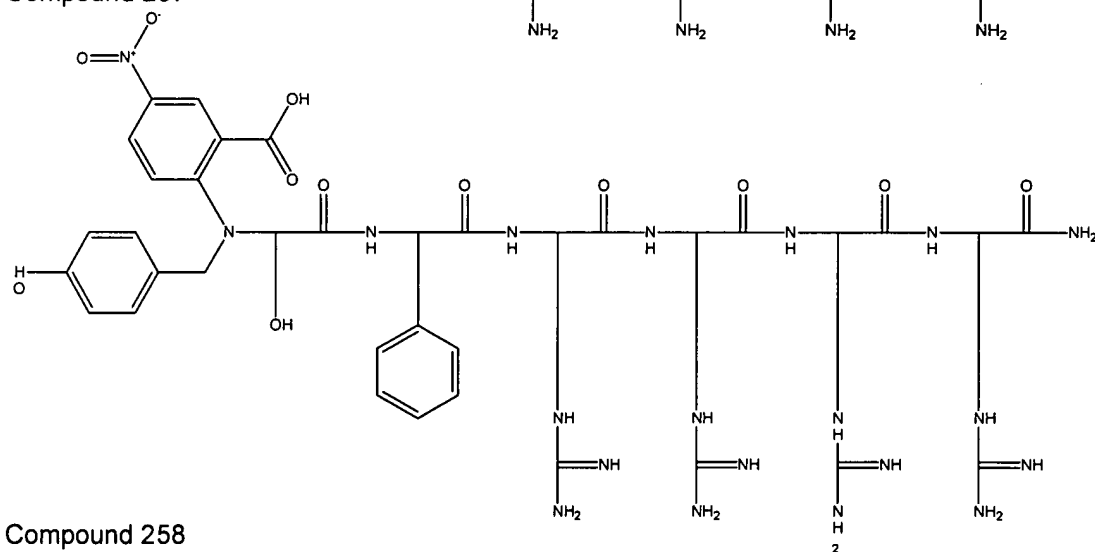
Applicant: David S. Lawrence
Serial No.: 10/755,086
Filed: January 9, 2004
page 109 of 190



page 110 of 190



Compound 257



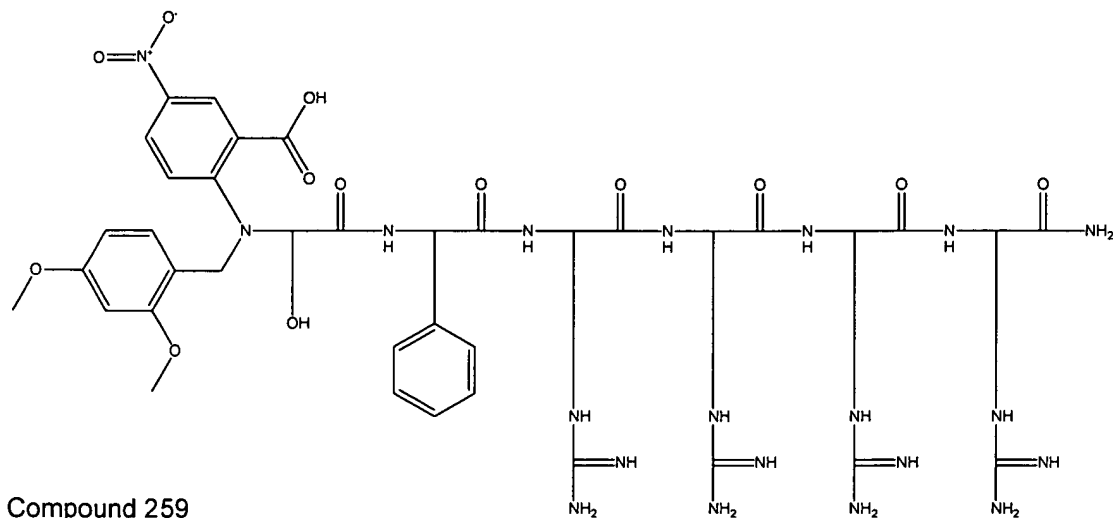
Compound 258

Applicant: David S. Lawrence

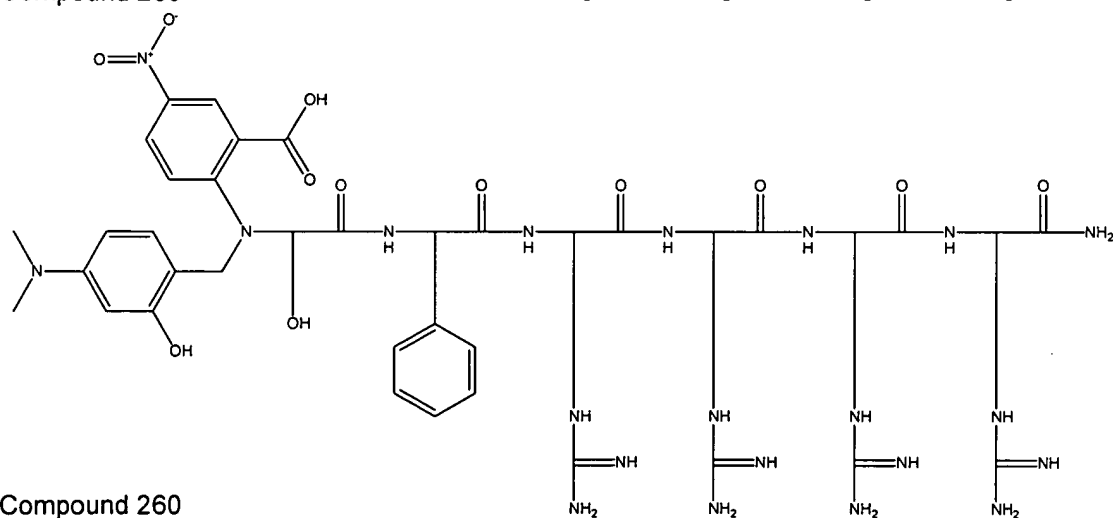
Serial No.: 10/755,086

Filed: January 9, 2004

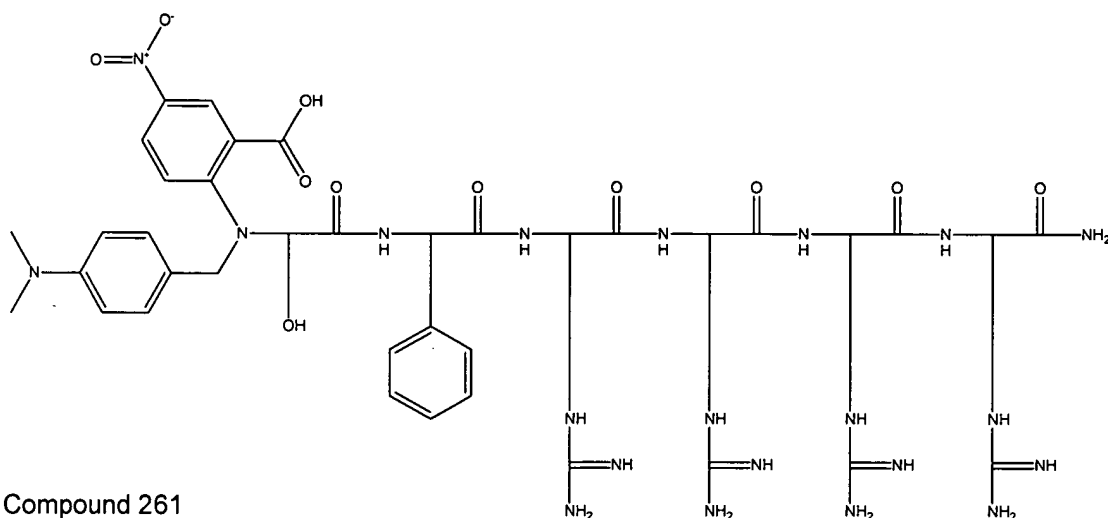
page 111 of 190



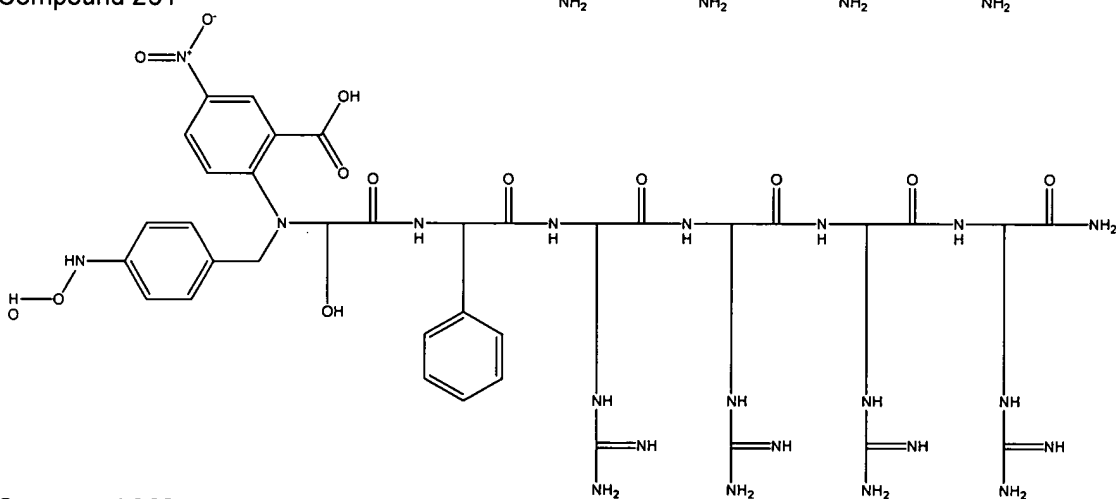
Compound 259



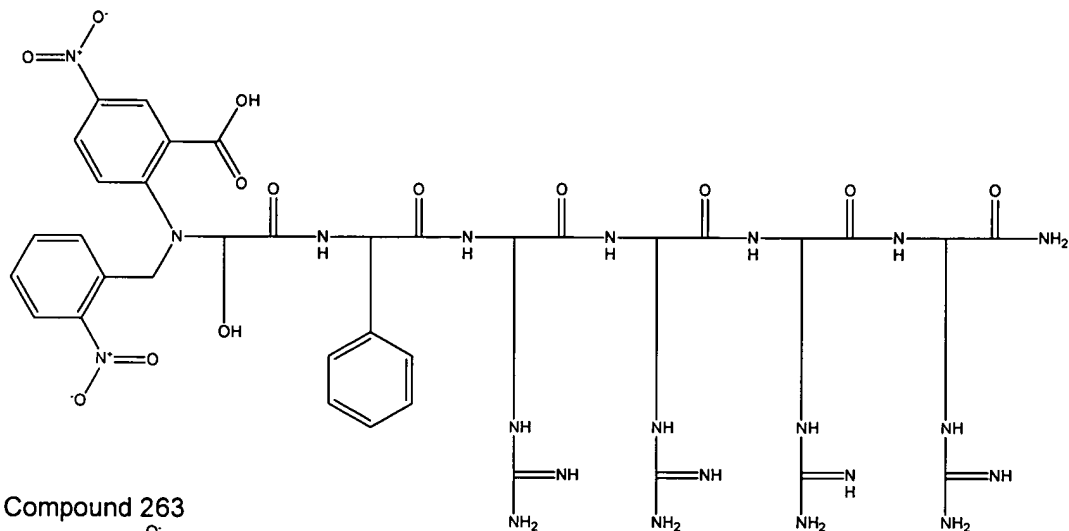
Compound 260



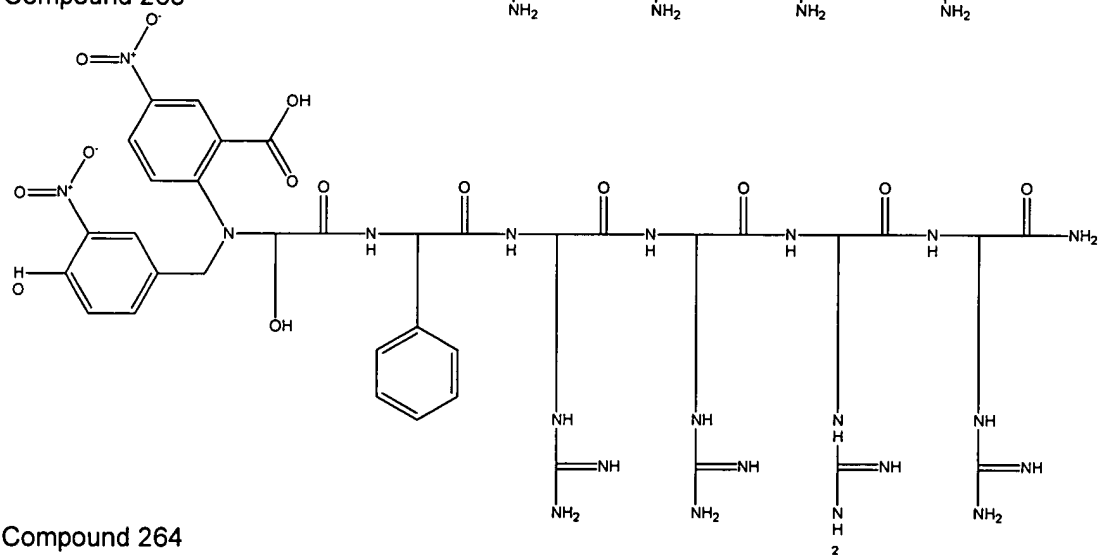
Compound 261



Compound 262

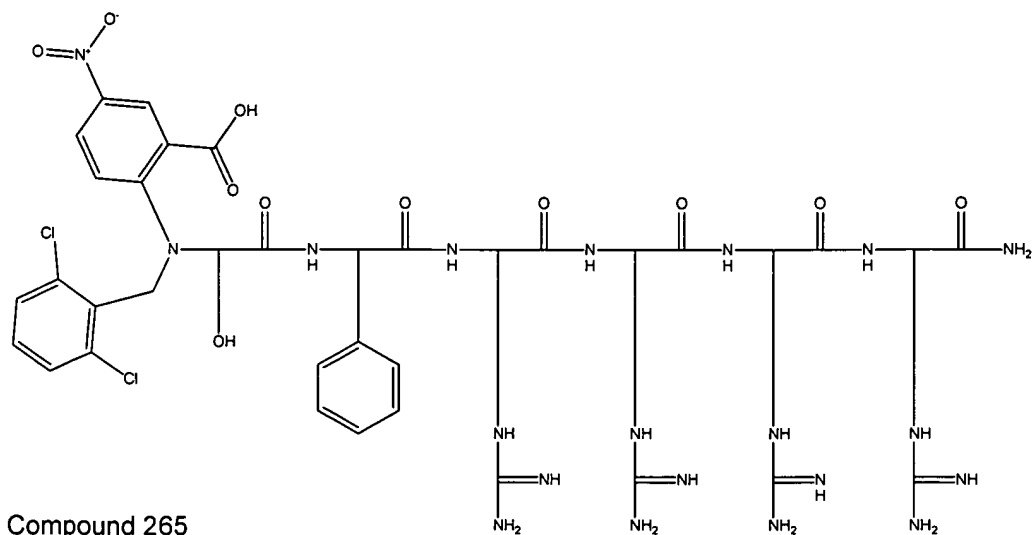


Compound 263

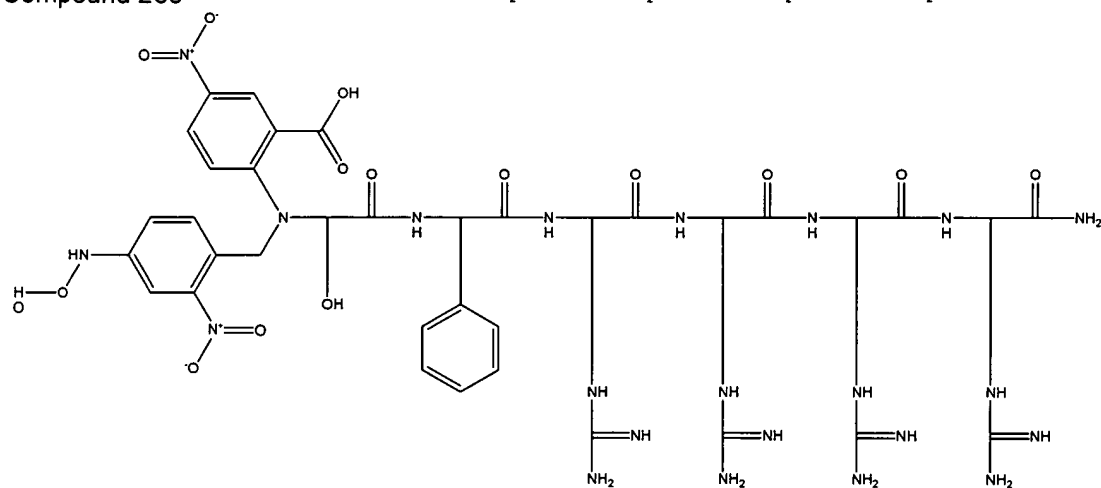


Compound 264

Applicant: David S. Lawrence
Serial No.: 10/755,086
Filed: January 9, 2004
page 114 of 190

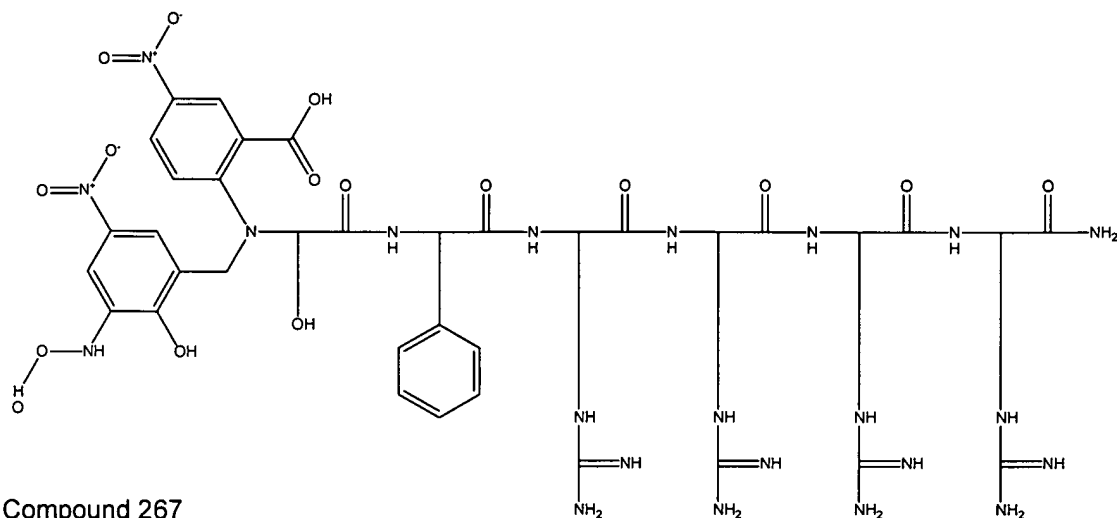


Compound 265

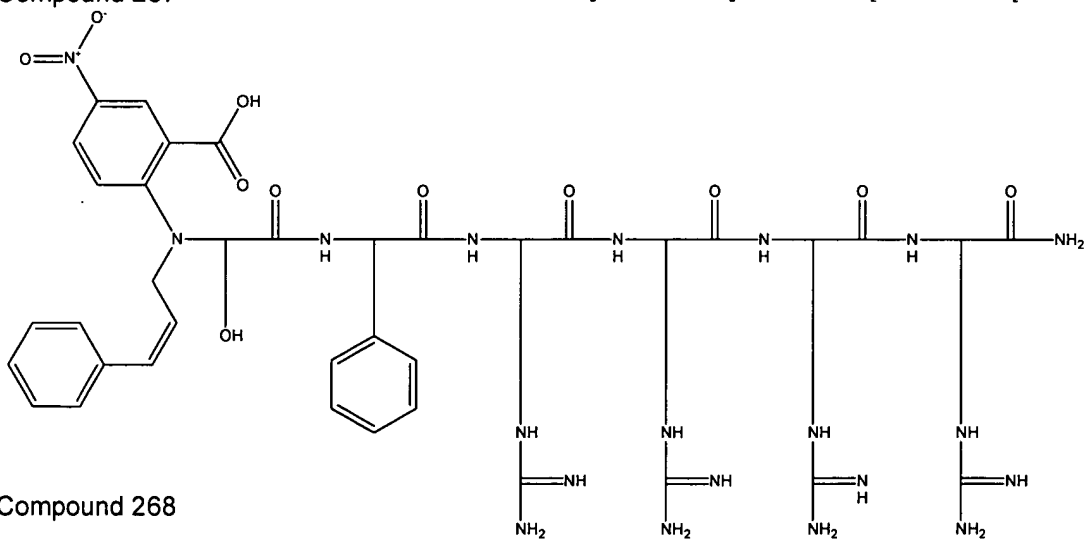


Compound 266

Applicant: David S. Lawrence
Serial No.: 10/755,086
Filed: January 9, 2004
page 115 of 190



Compound 267



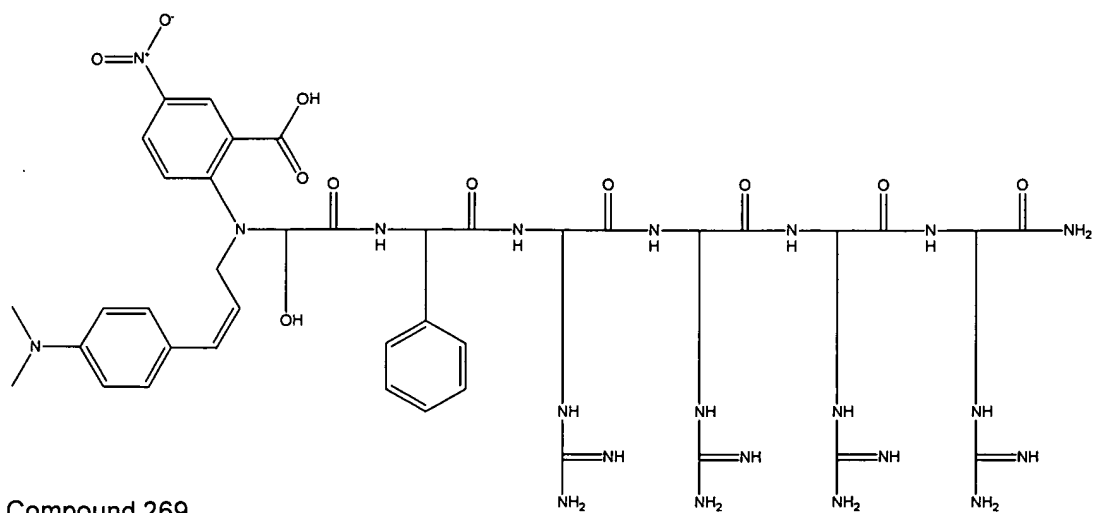
Compound 268

Applicant: David S. Lawrence

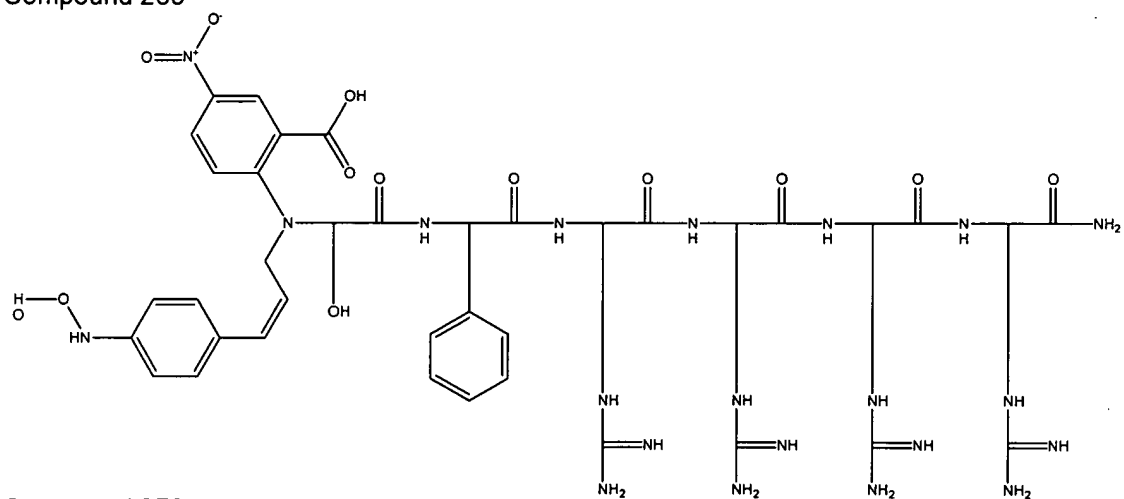
Serial No.: 10/755,086

Filed: January 9, 2004

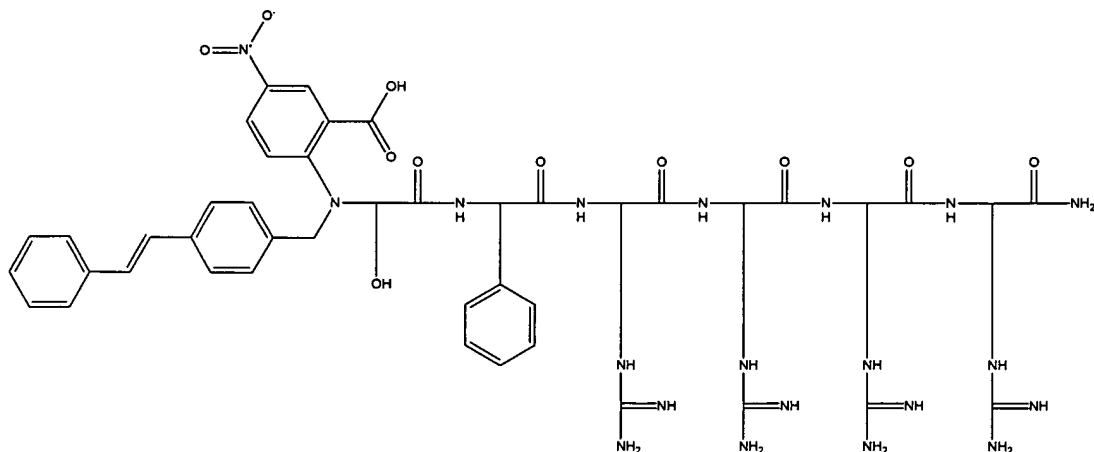
page 116 of 190



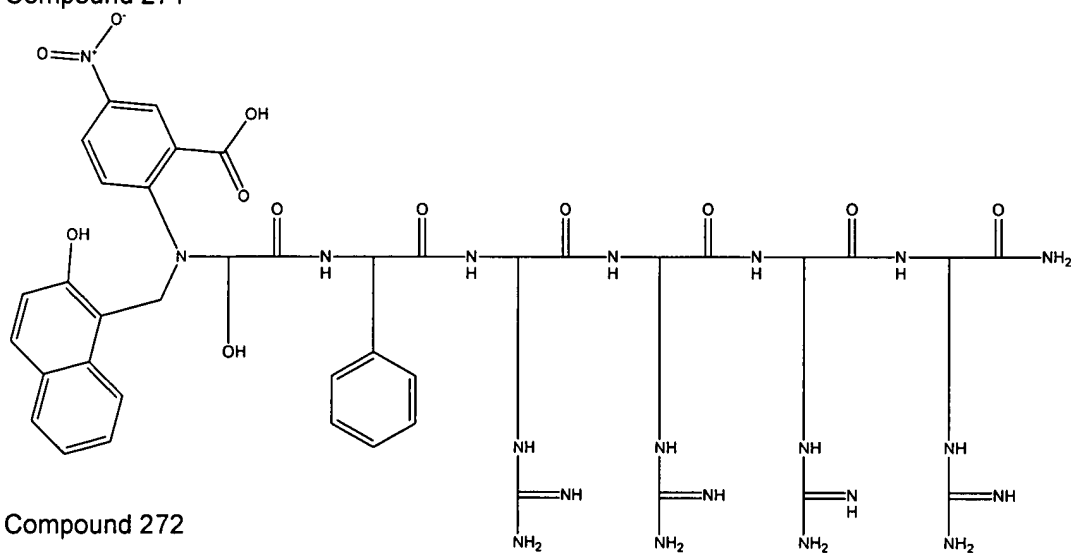
Compound 269



Compound 270



Compound 271



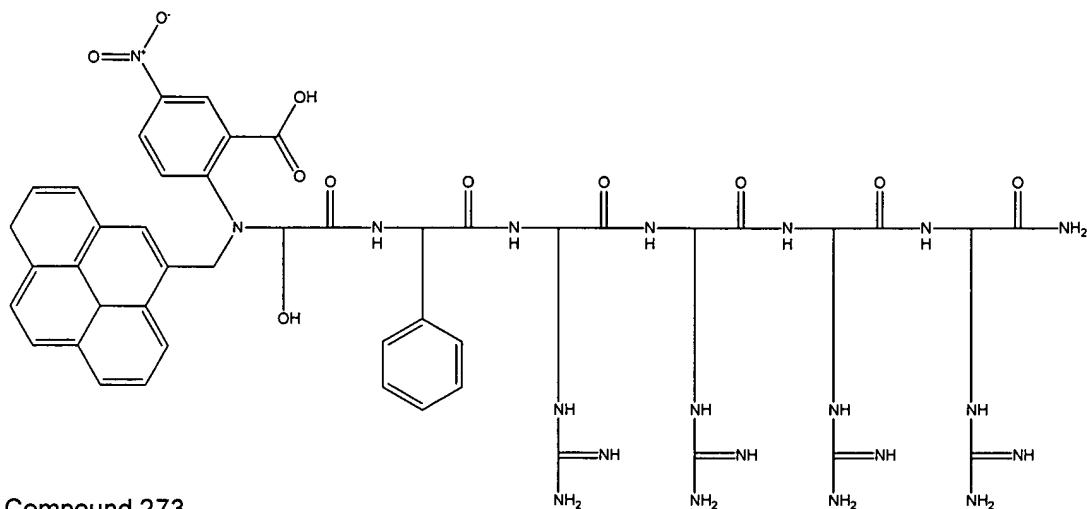
Compound 272

Applicant: David S. Lawrence

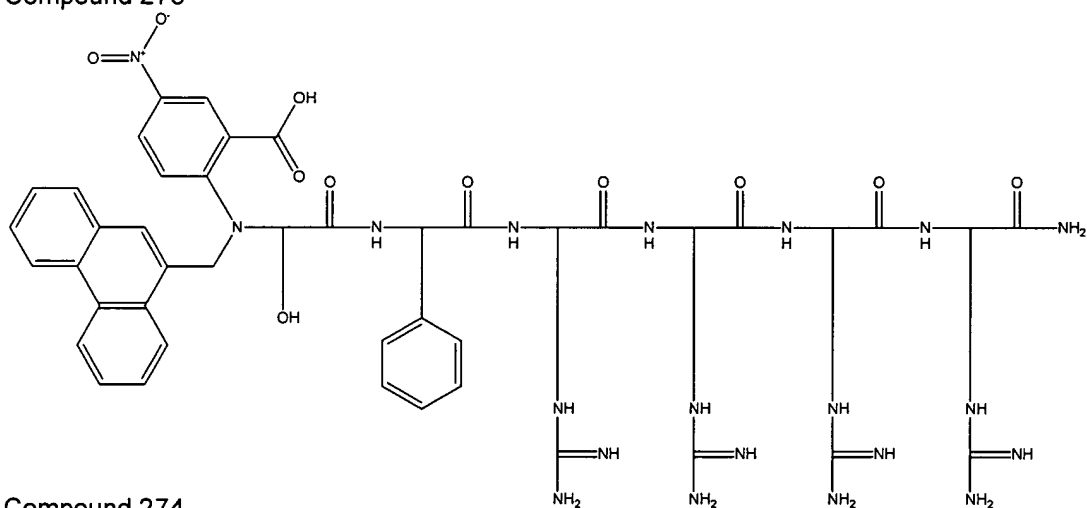
Serial No.: 10/755,086

Filed: January 9, 2004

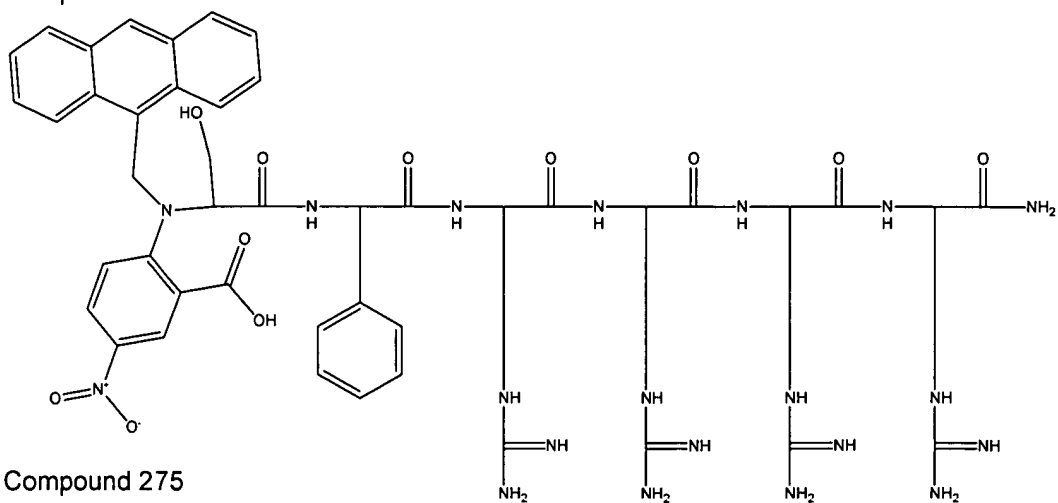
page 118 of 190



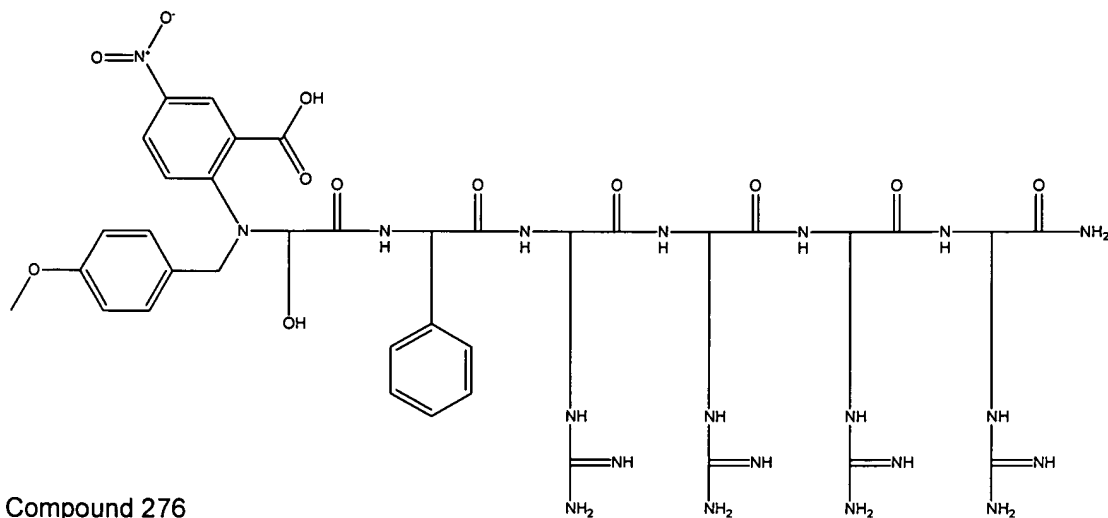
Compound 273



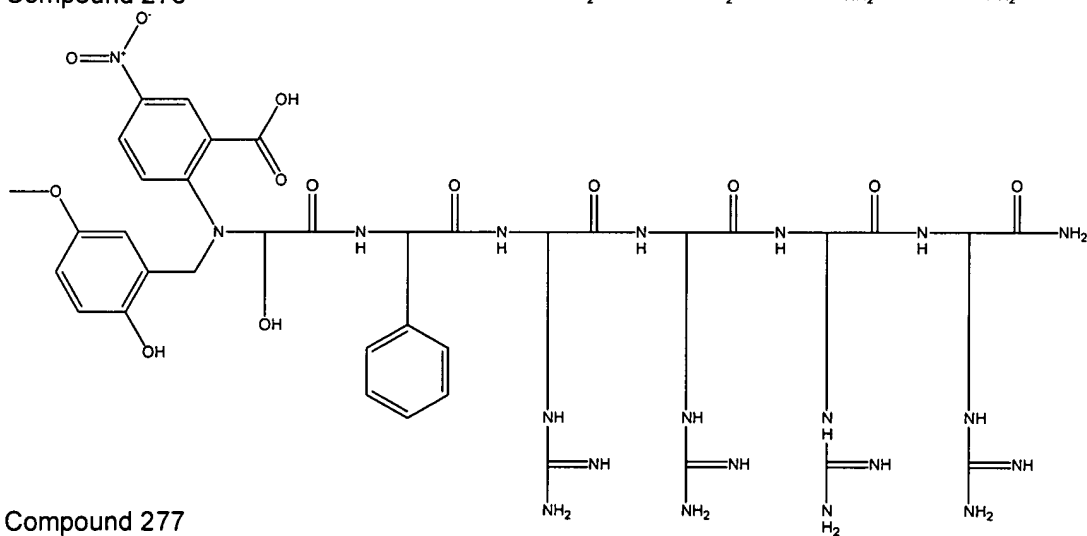
Compound 274



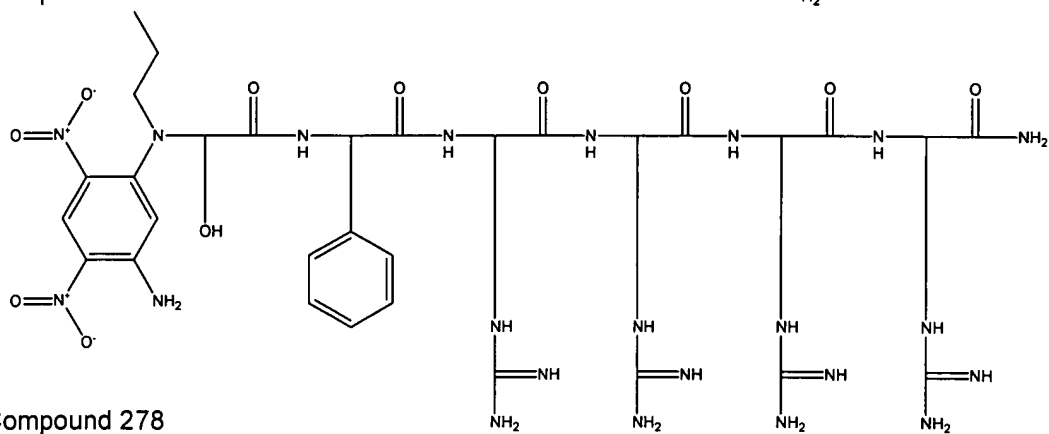
Compound 275



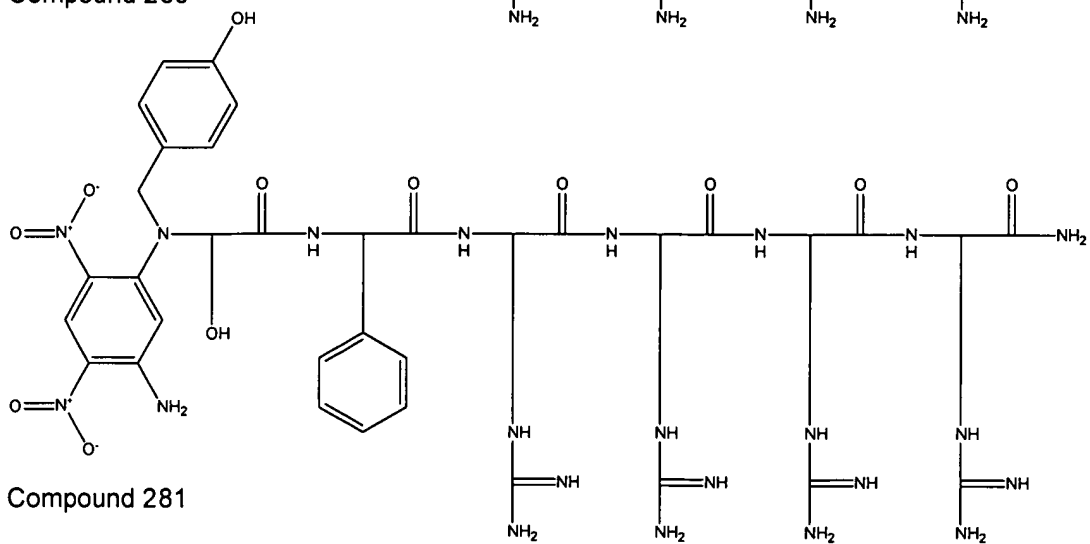
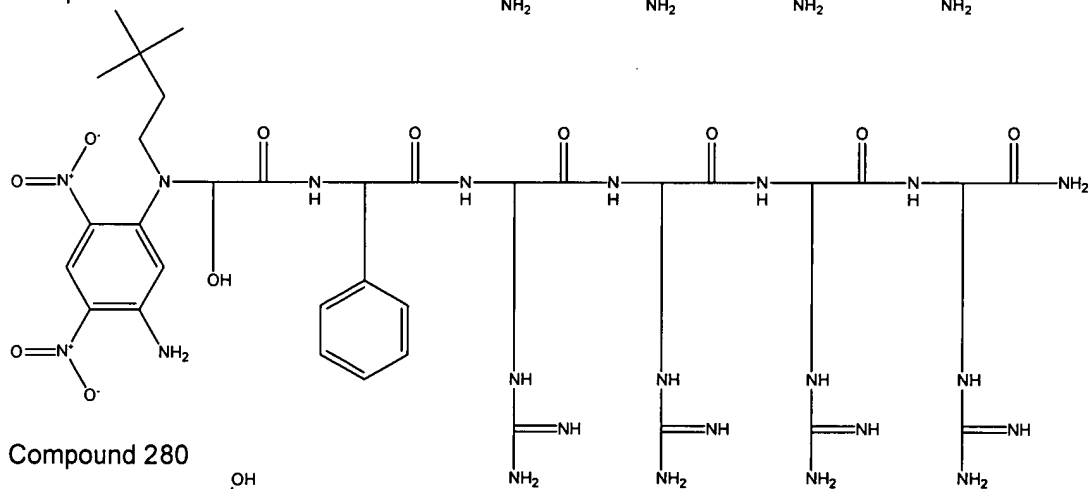
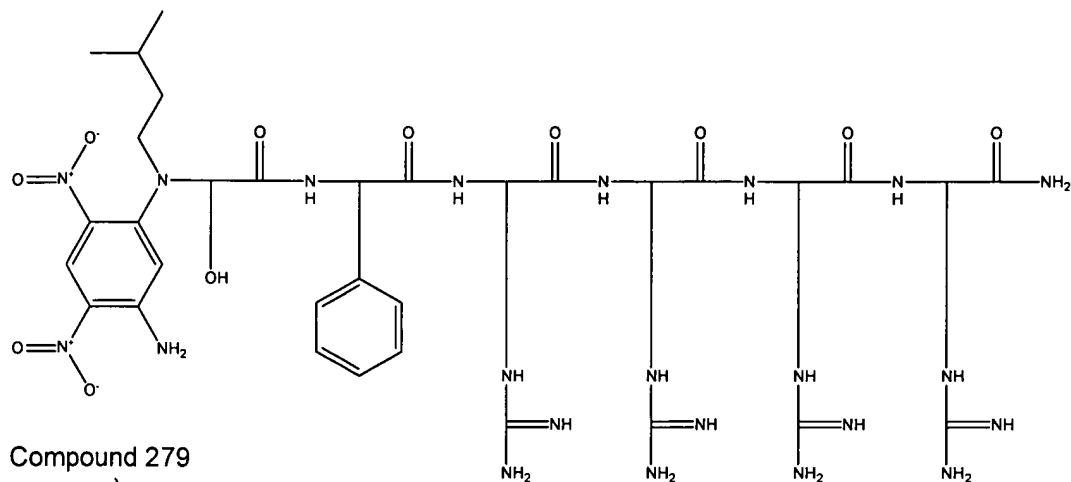
Compound 276

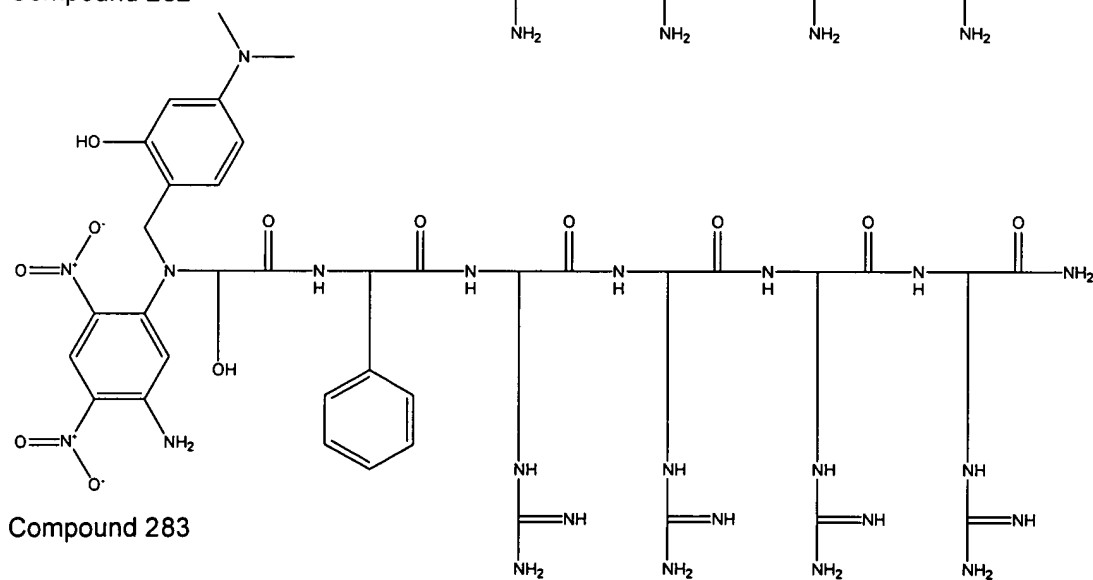
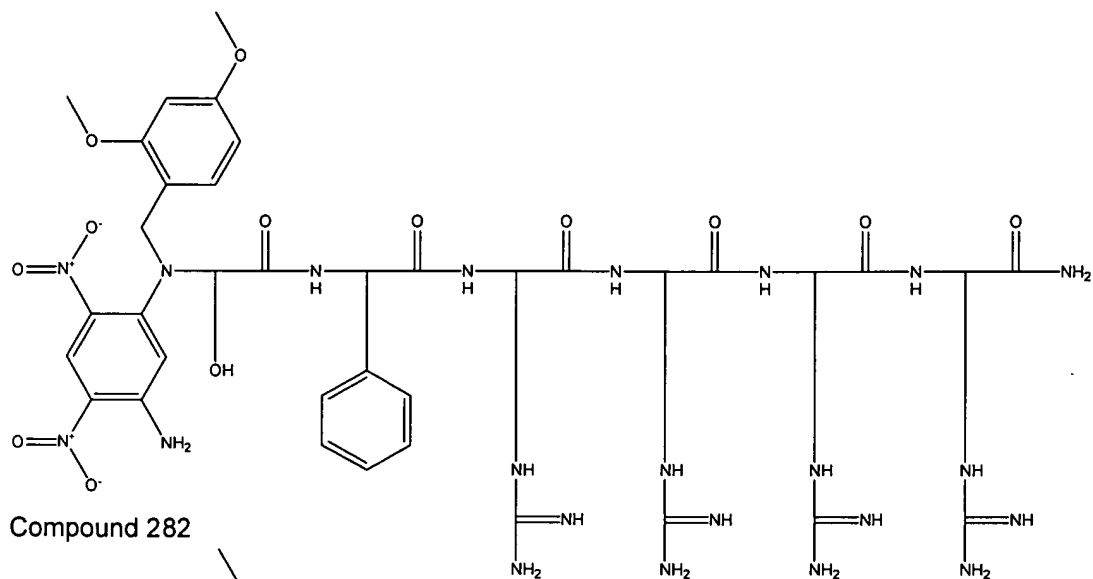


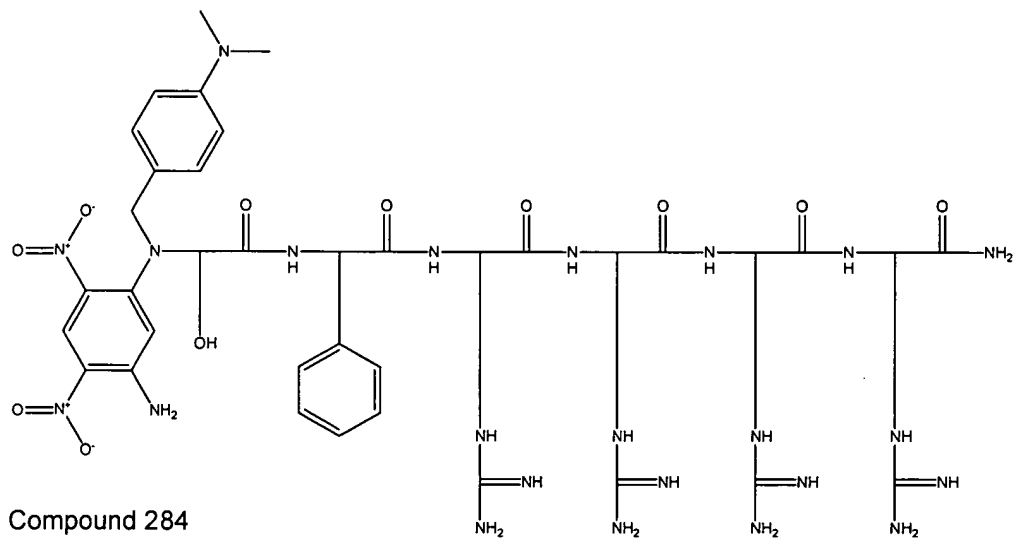
Compound 277



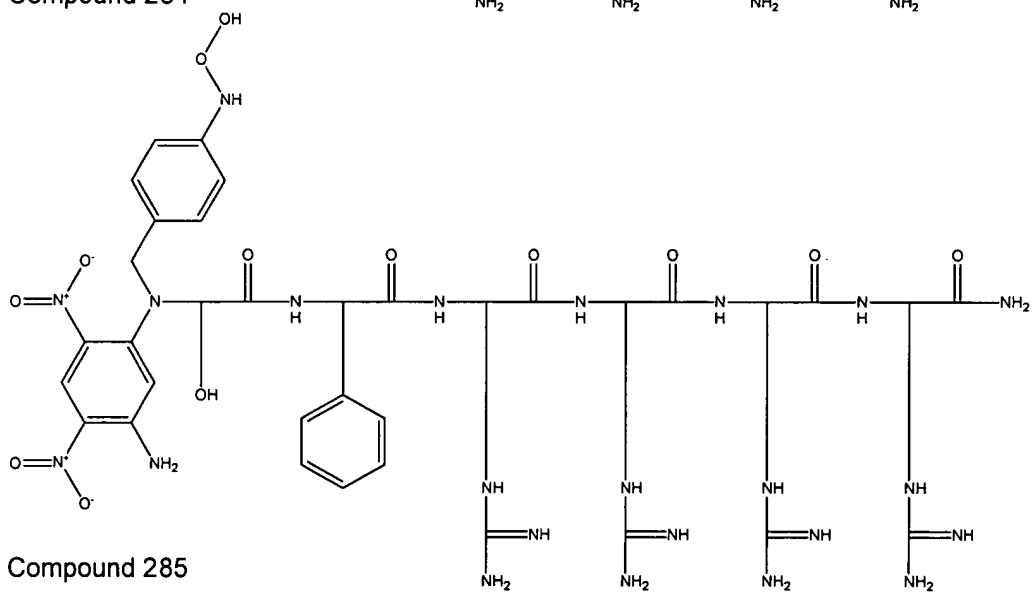
Compound 278



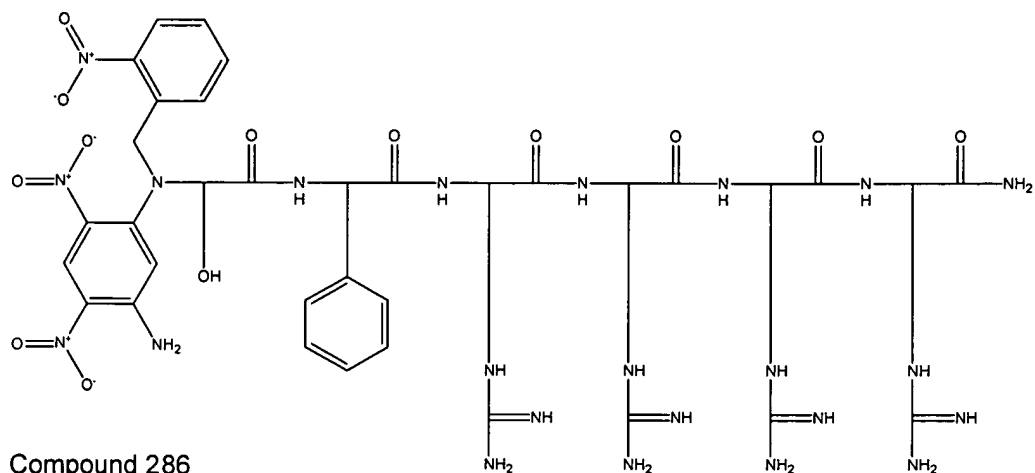




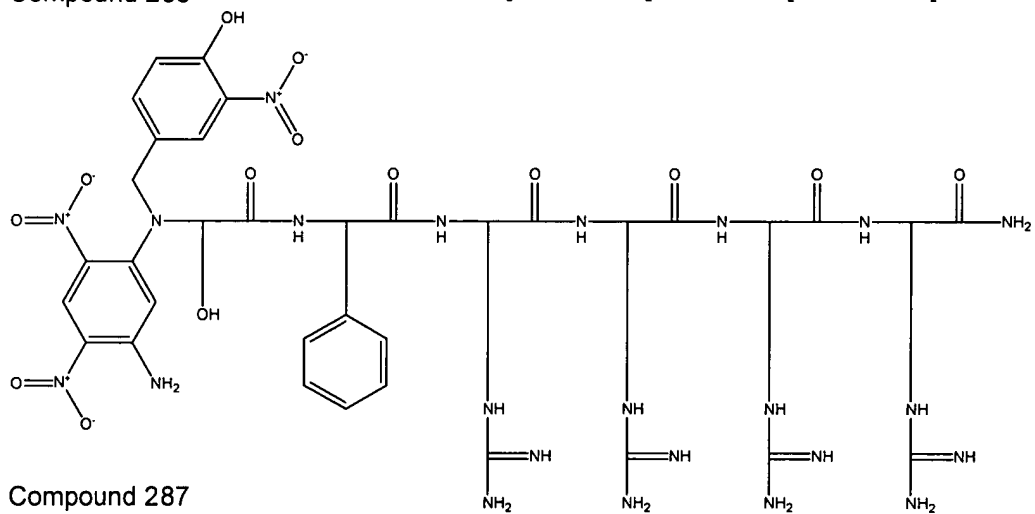
Compound 284



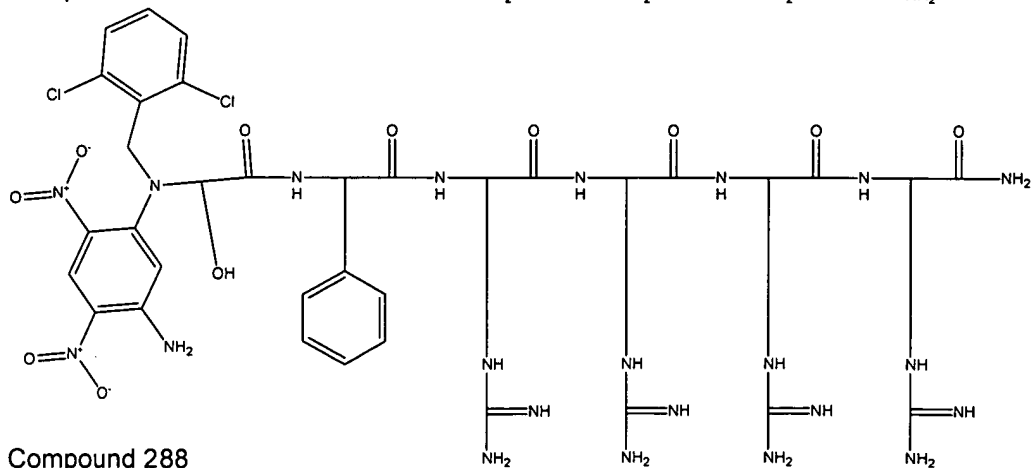
Compound 285



Compound 286

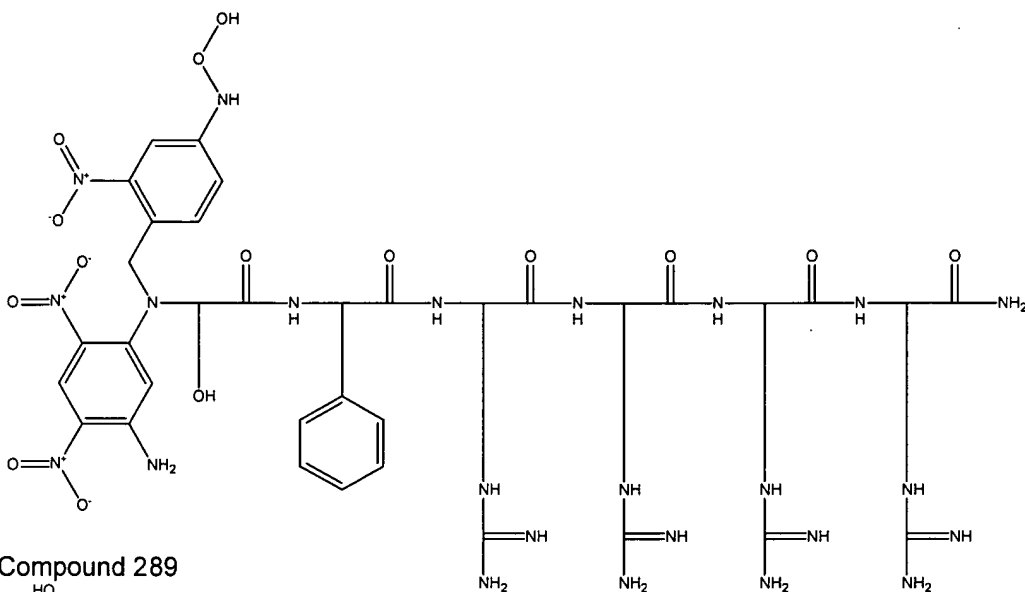


Compound 287

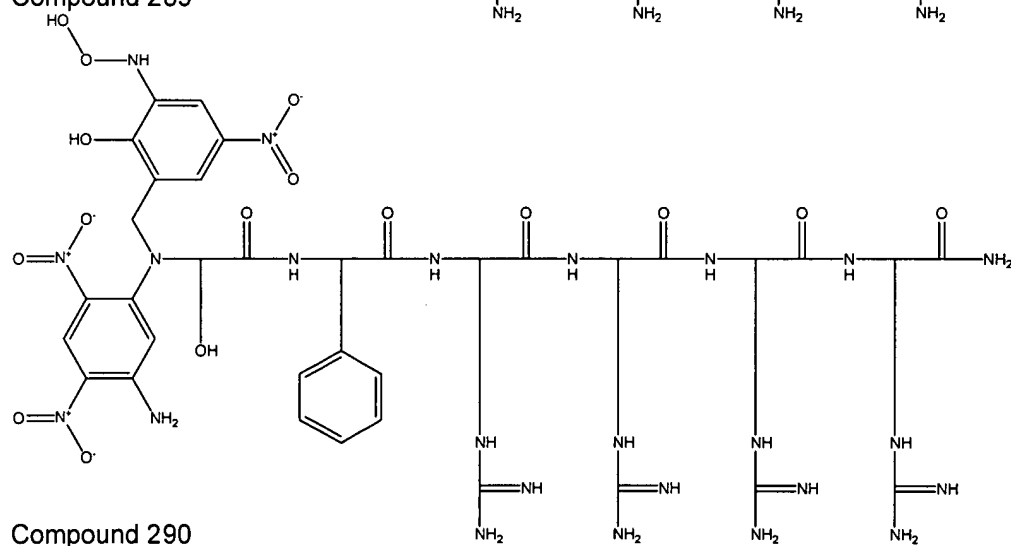


Compound 288

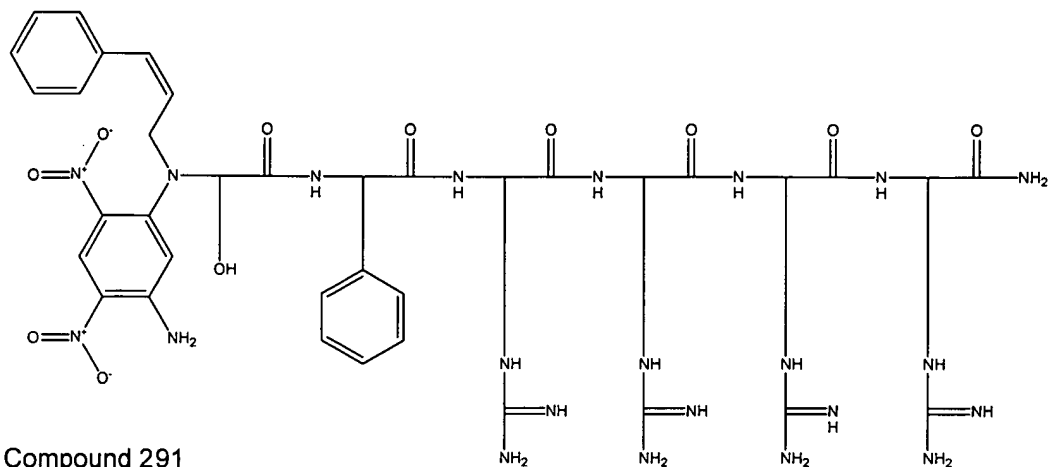
Applicant: David S. Lawrence
Serial No.: 10/755,086
Filed: January 9, 2004
page 124 of 190



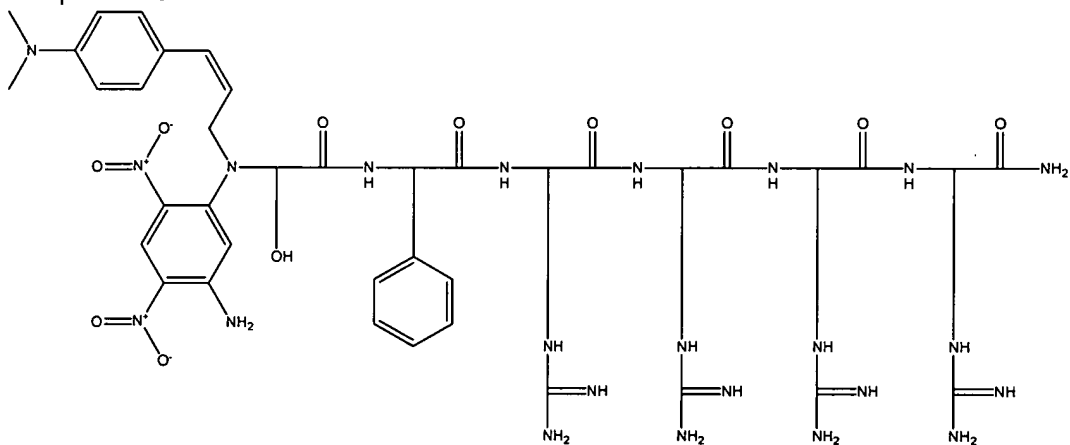
Compound 289



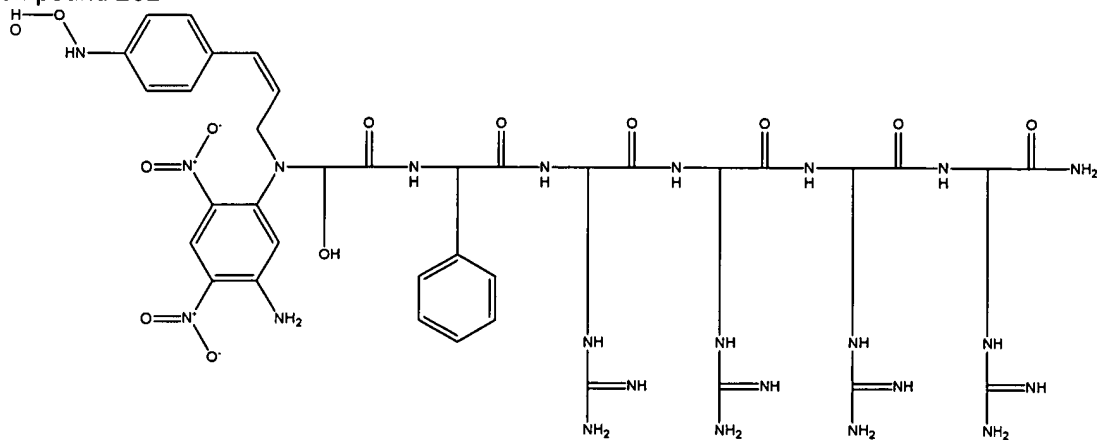
Compound 290



Compound 291



Compound 292



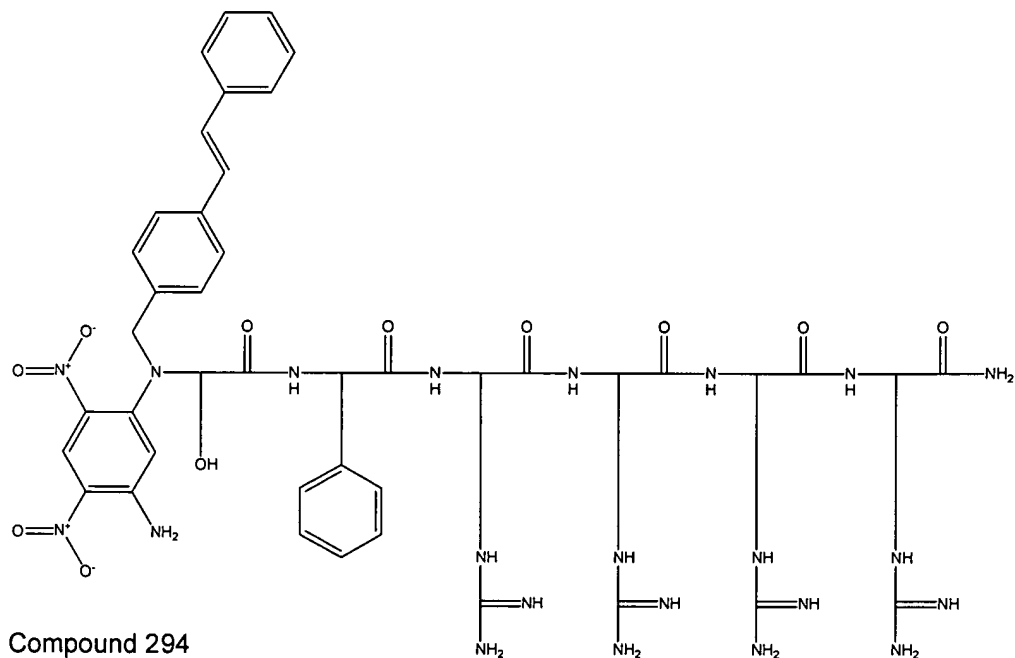
Compound 293

Applicant: David S. Lawrence

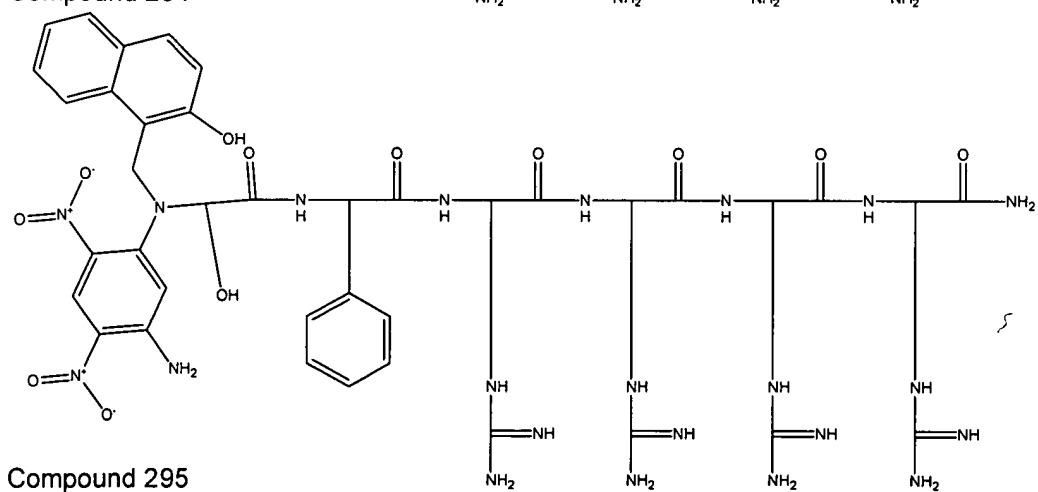
Serial No.: 10/755,086

Filed: January 9, 2004

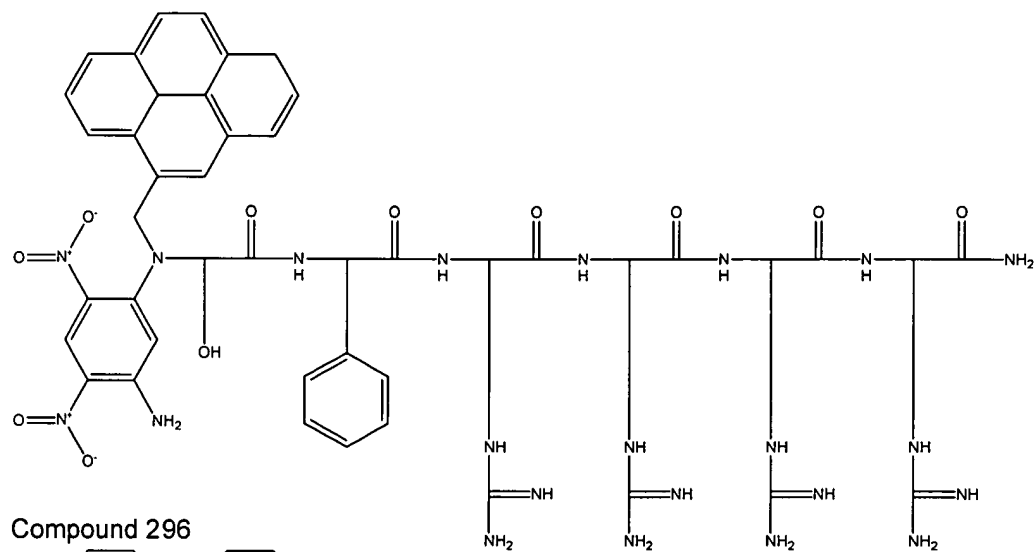
page 126 of 190



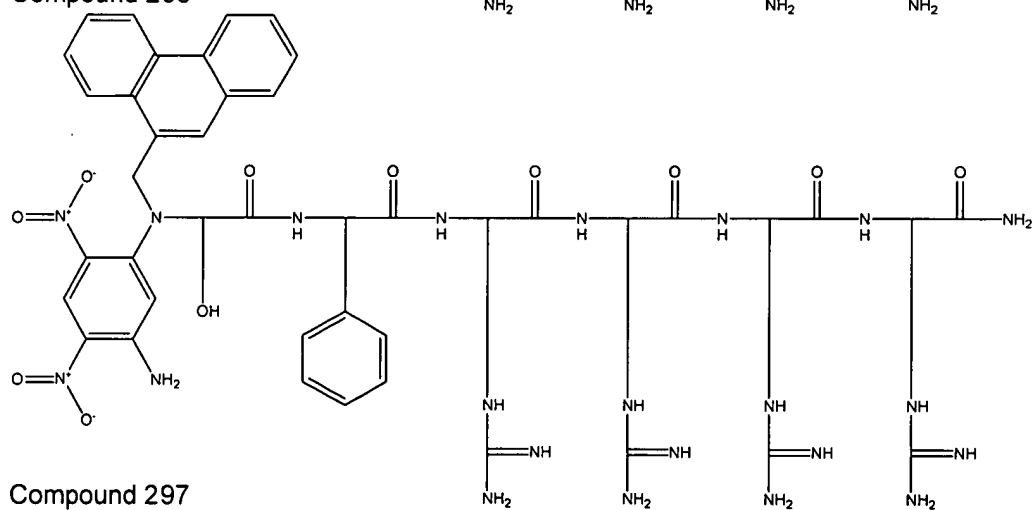
Compound 294



Compound 295

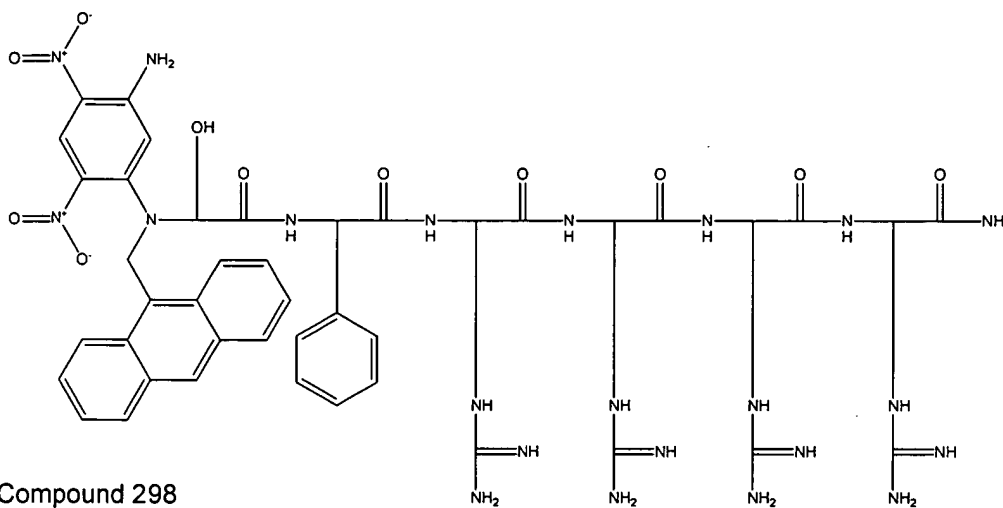


Compound 296

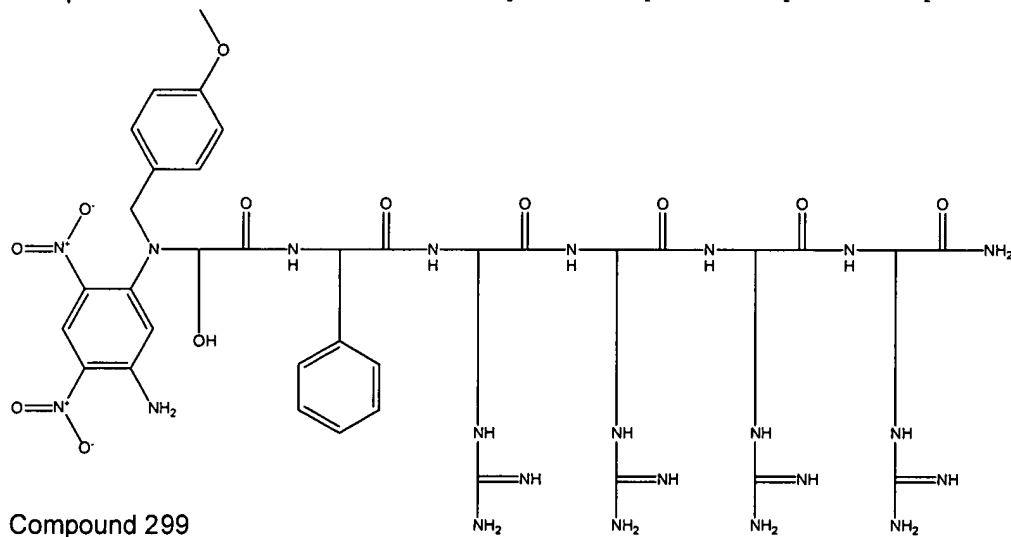


Compound 297

Applicant: David S. Lawrence
Serial No.: 10/755,086
Filed: January 9, 2004
page 128 of 190



Compound 298



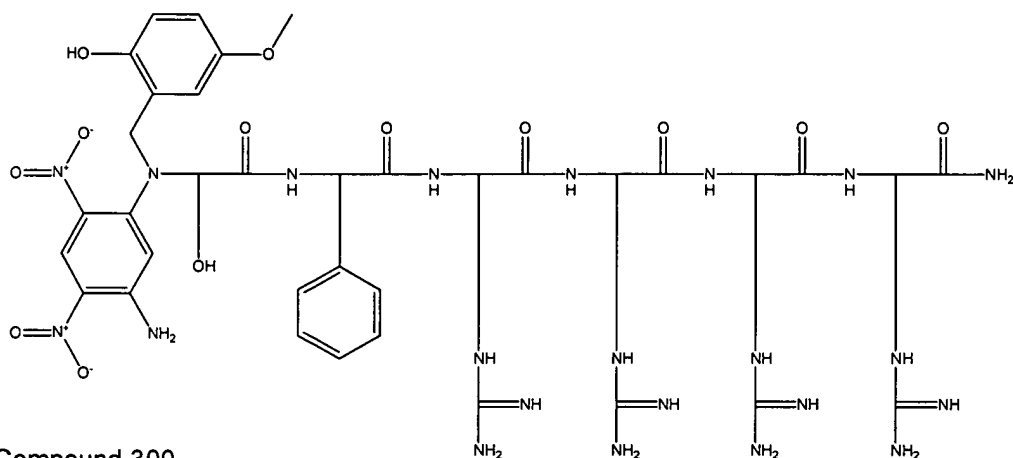
Compound 299

Applicant: David S. Lawrence

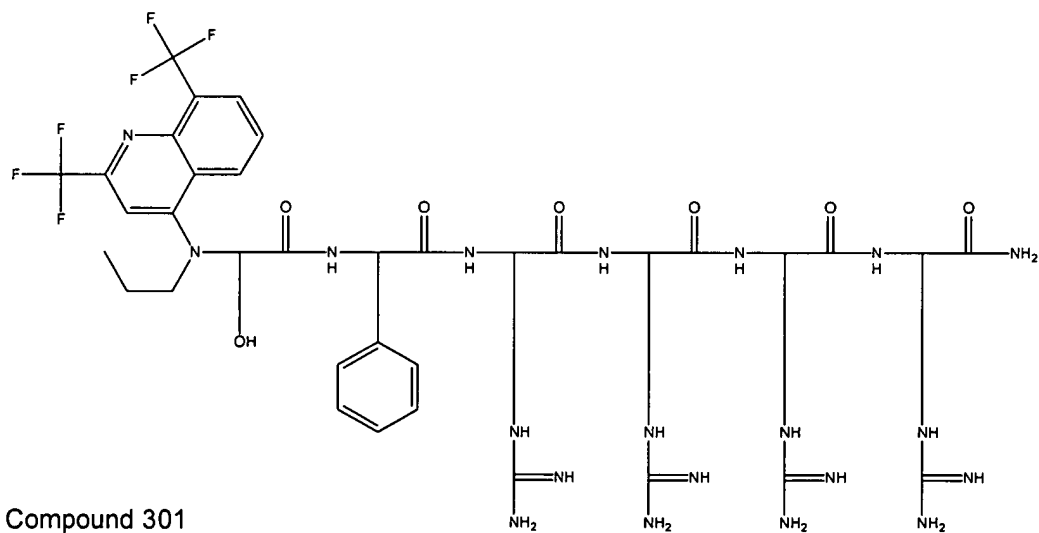
Serial No.: 10/755,086

Filed: January 9, 2004

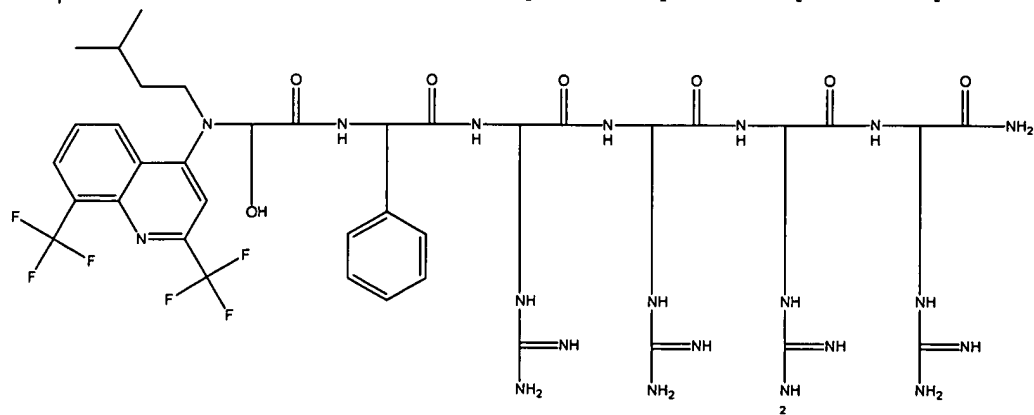
page 129 of 190



Compound 300



Compound 301



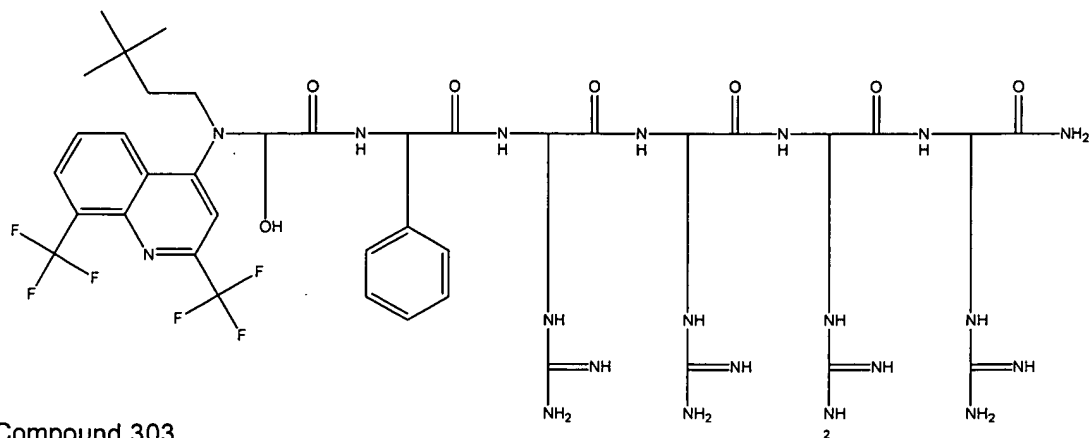
Compound 302

Applicant: David S. Lawrence

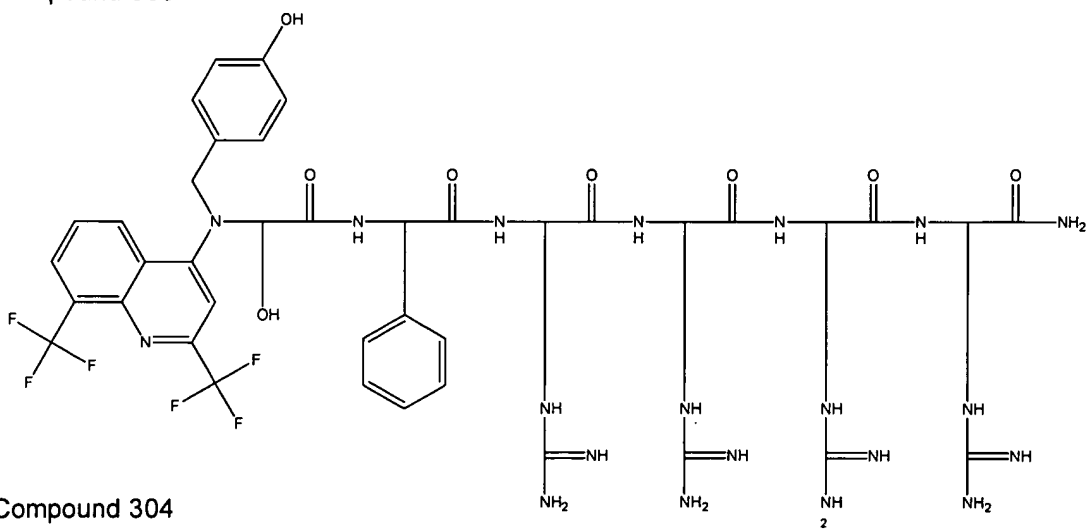
Serial No.: 10/755,086

Filed: January 9, 2004

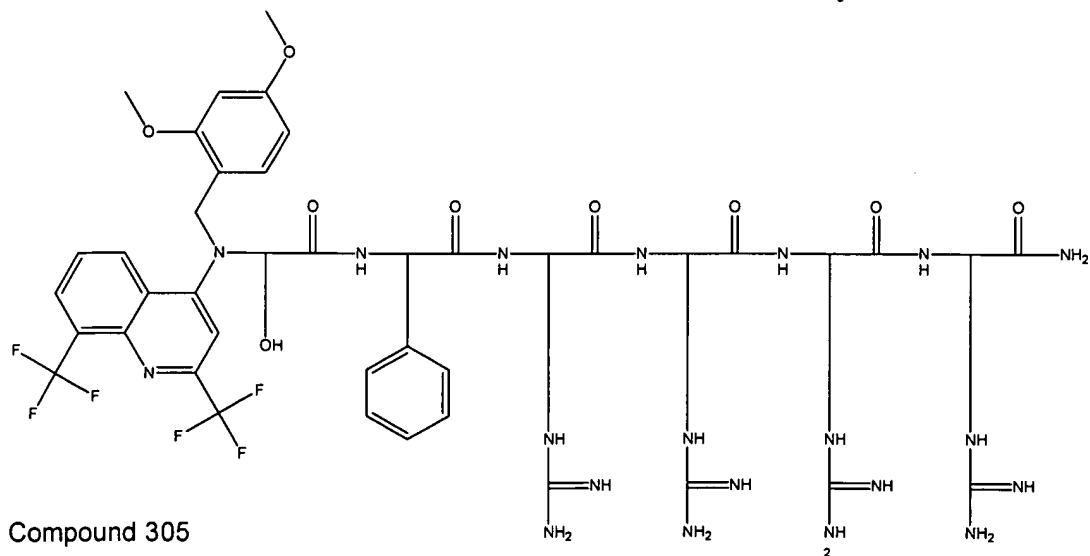
page 130 of 190



Compound 303



Compound 304



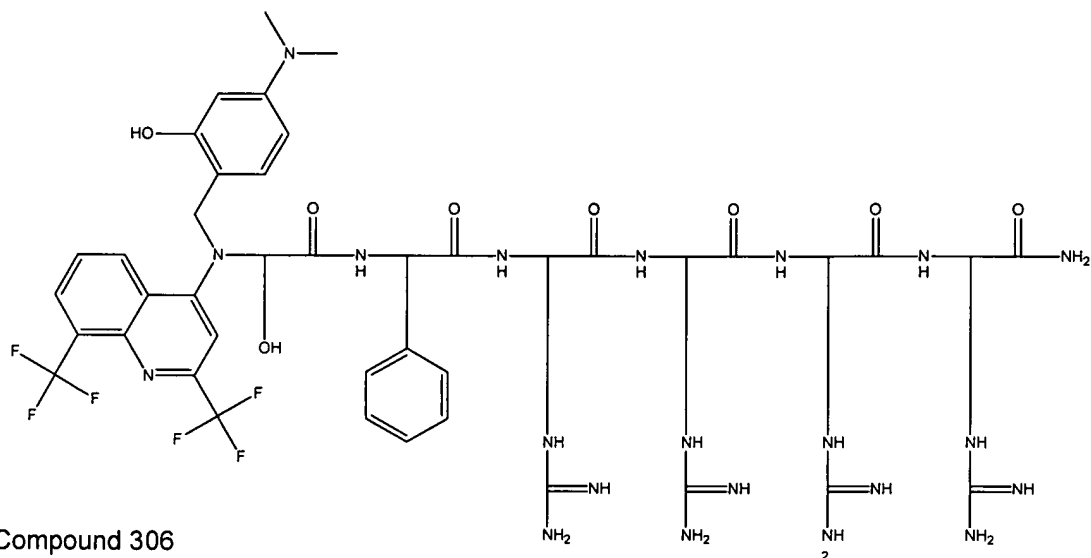
Compound 305

Applicant: David S. Lawrence

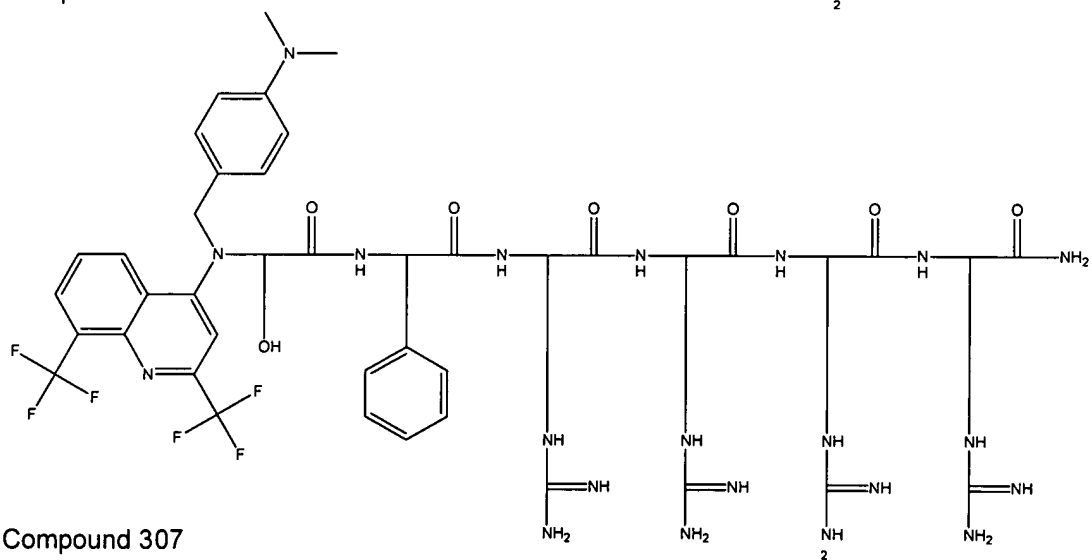
Serial No.: 10/755,086

Filed: January 9, 2004

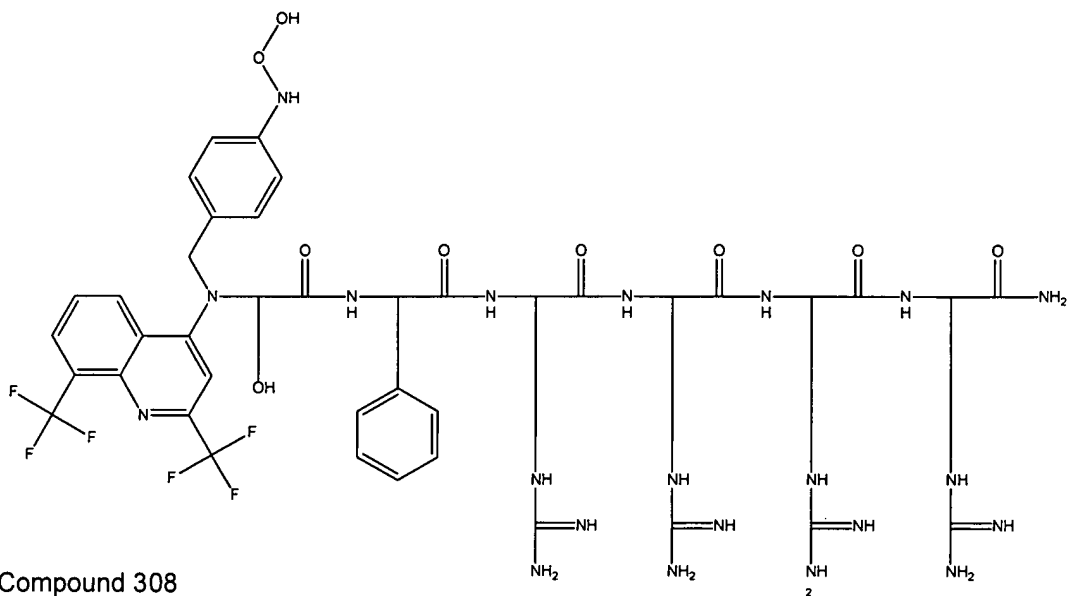
page 131 of 190



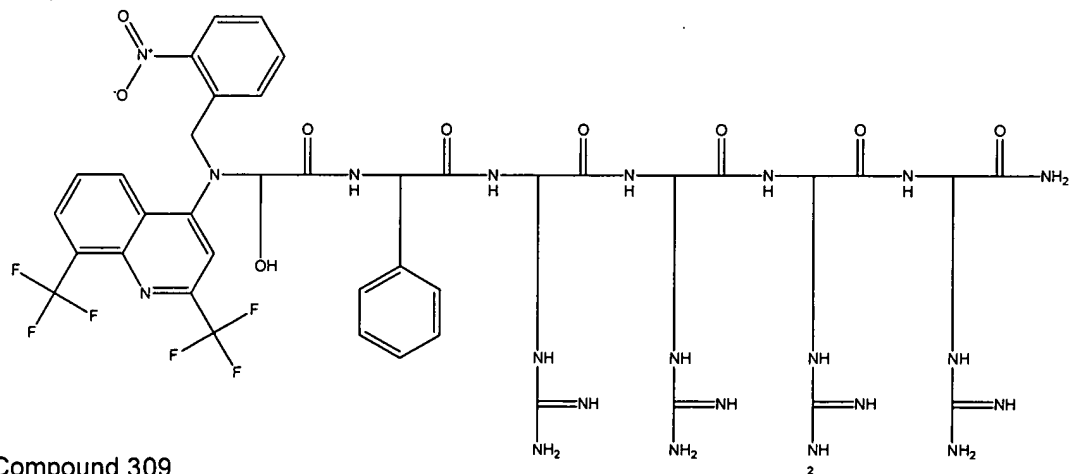
Compound 306



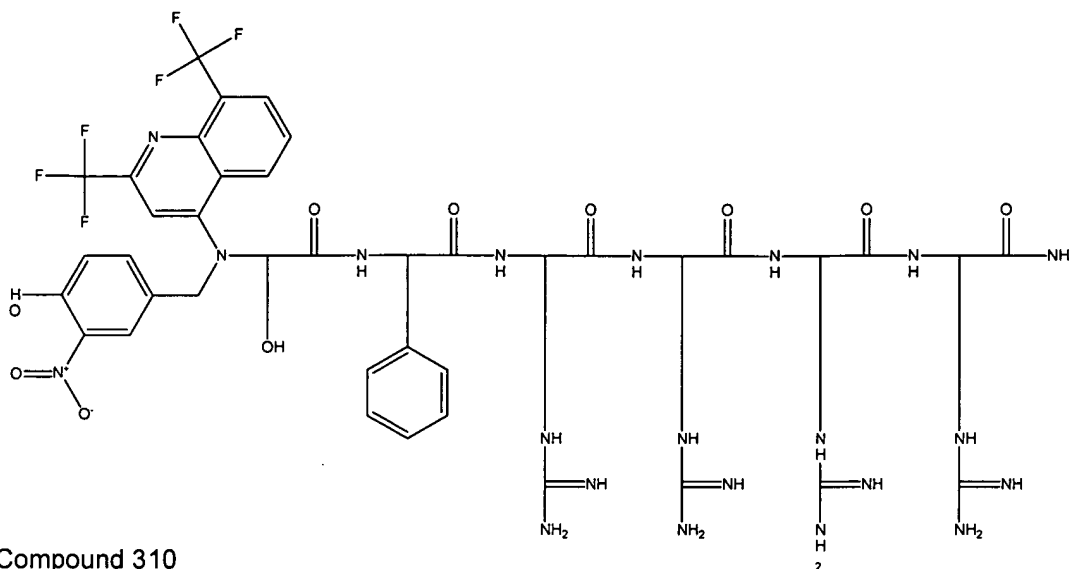
Compound 307



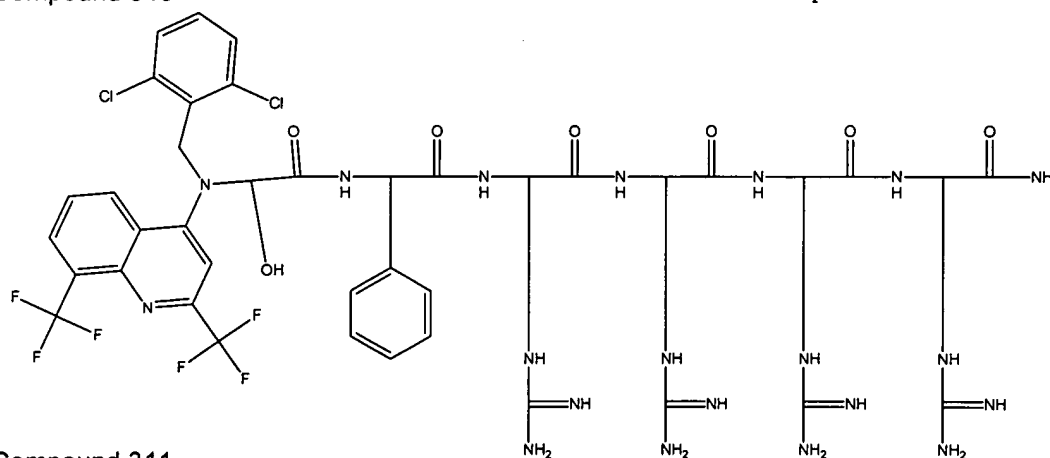
Compound 308



Compound 309

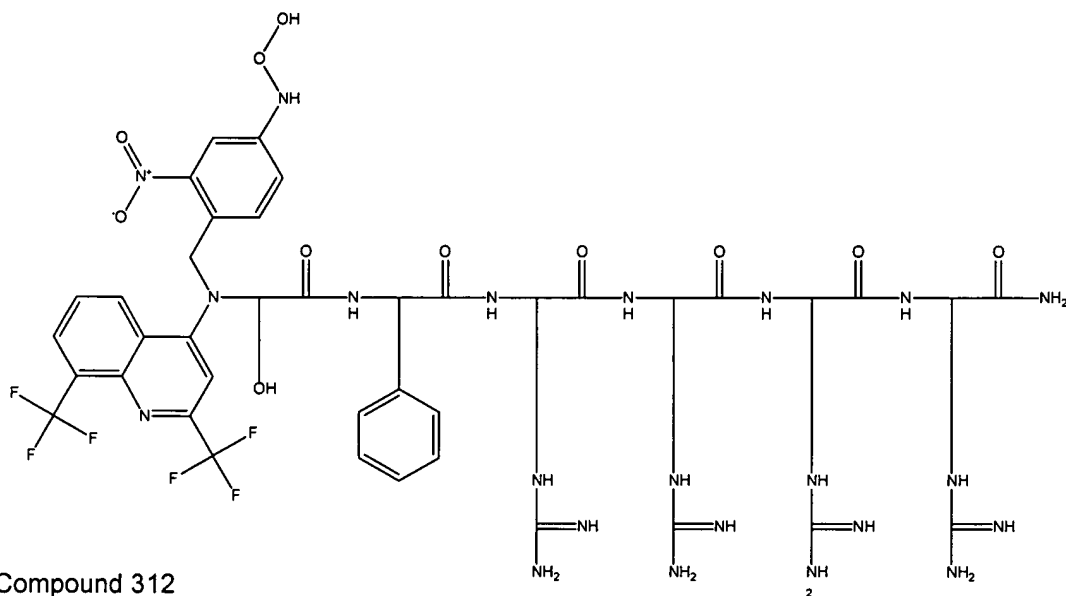


Compound 310

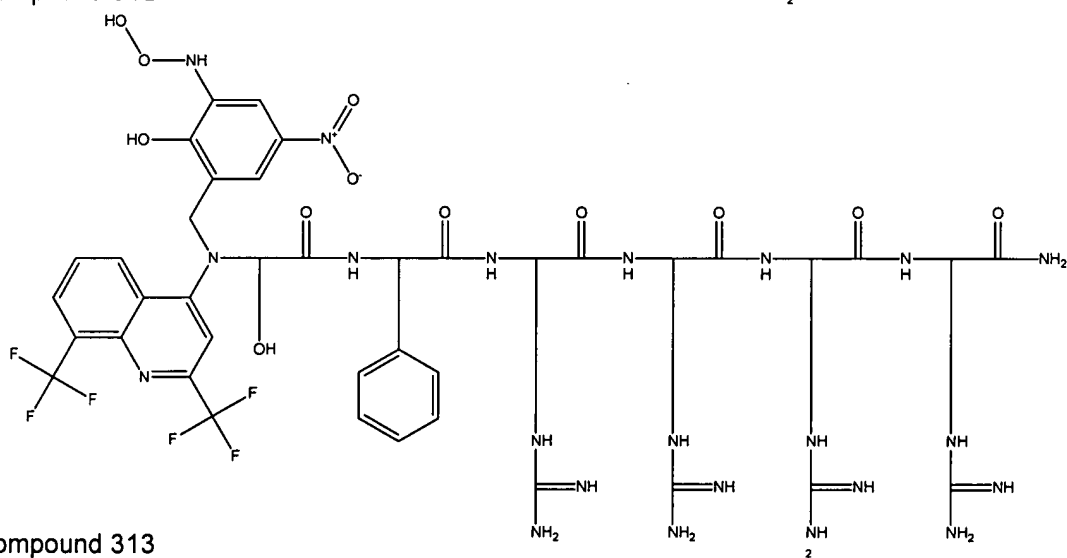


Compound 311

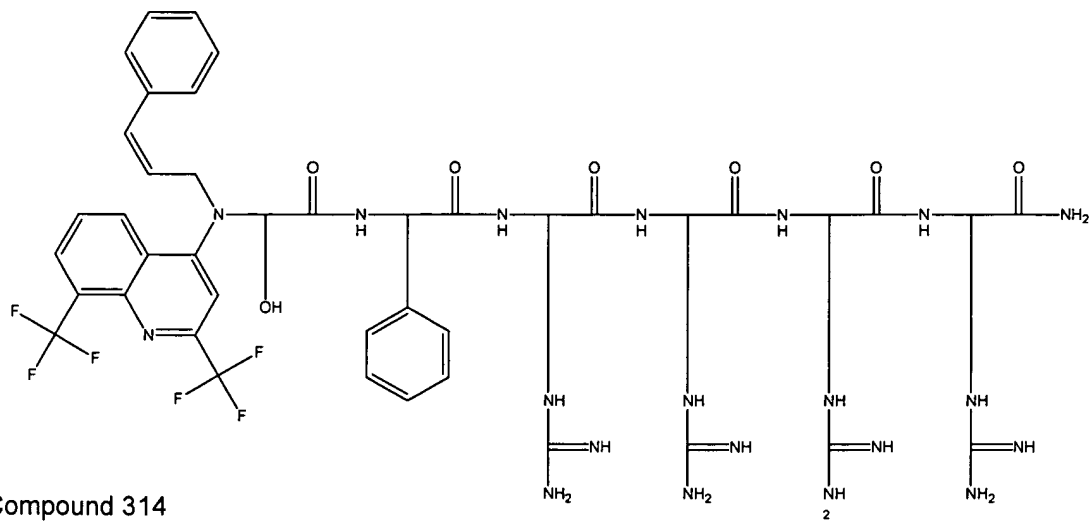
Applicant: David S. Lawrence
Serial No.: 10/755,086
Filed: January 9, 2004
page 134 of 190



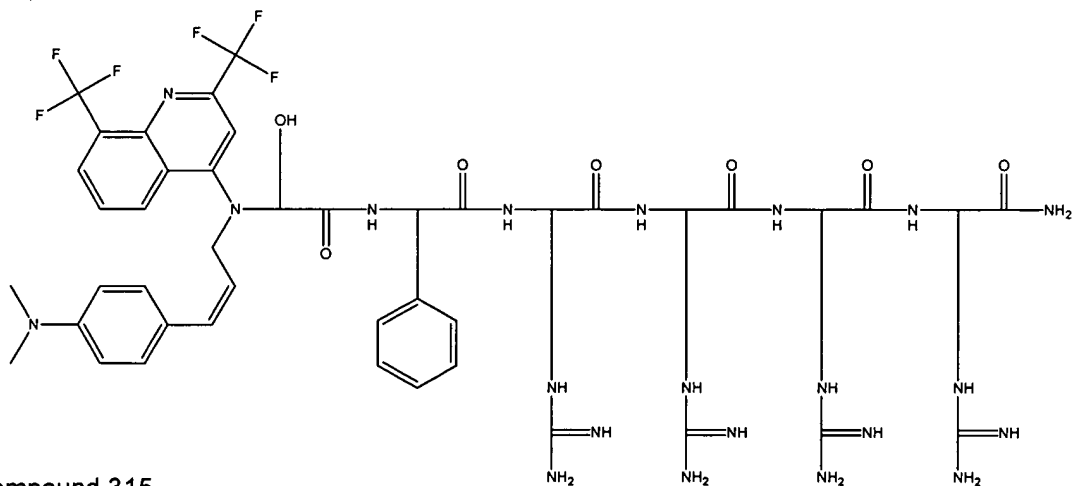
Compound 312



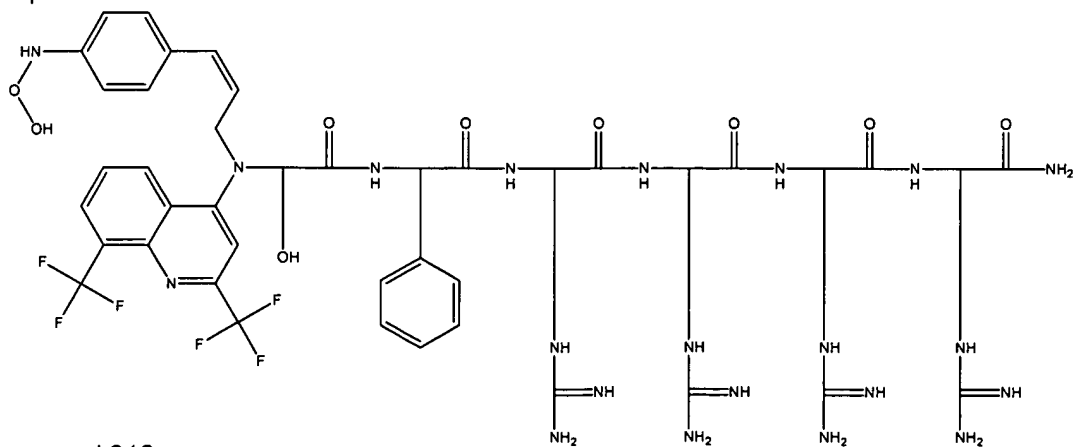
Compound 313



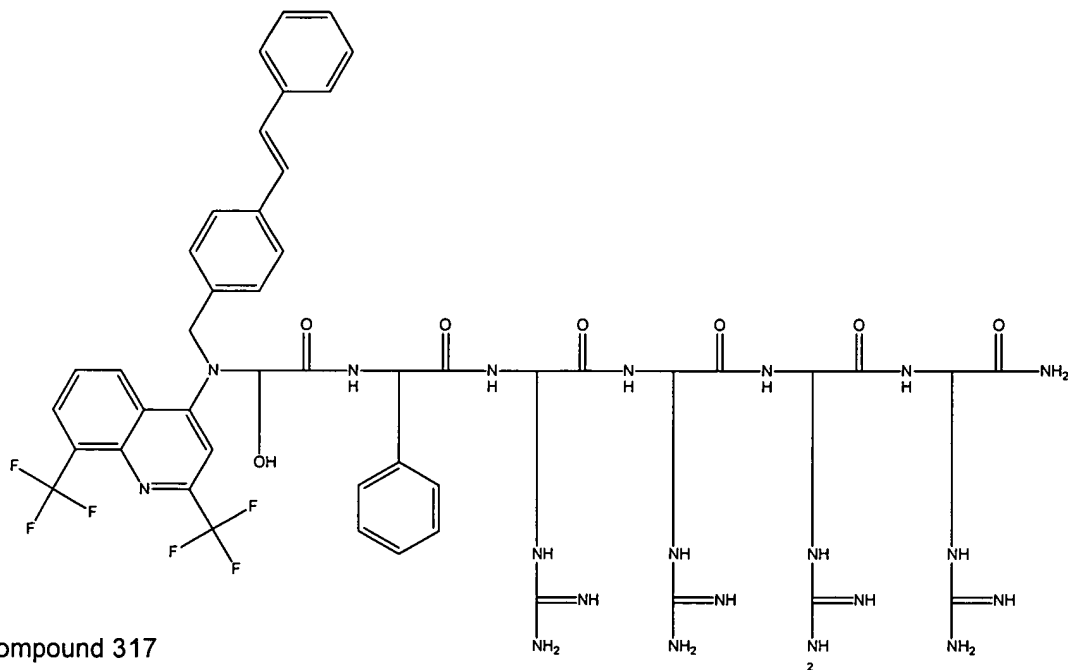
Compound 314



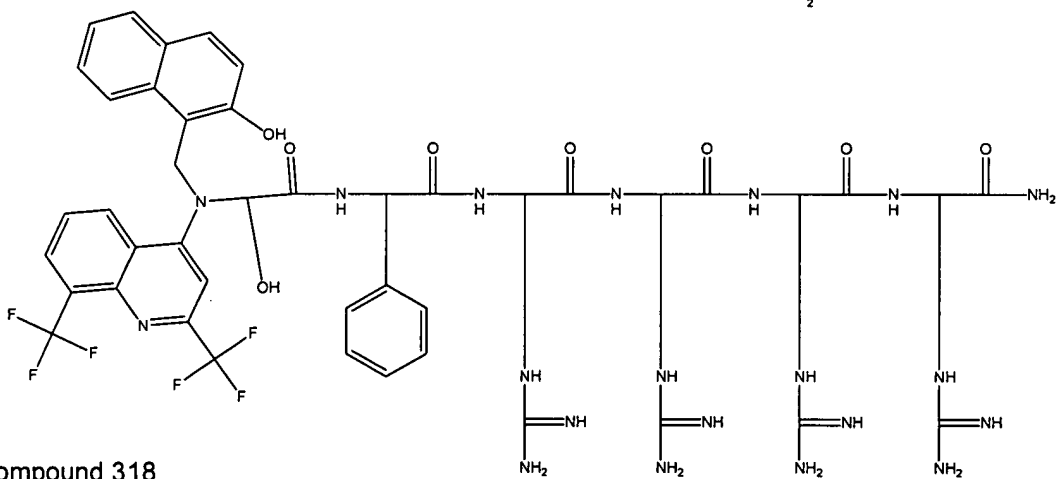
Compound 315



Compound 316

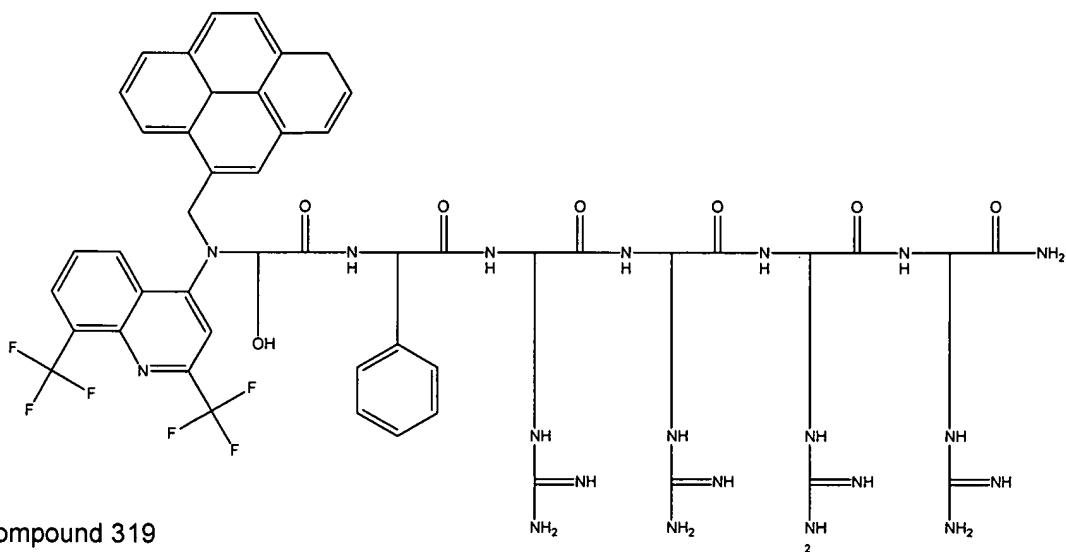


Compound 317

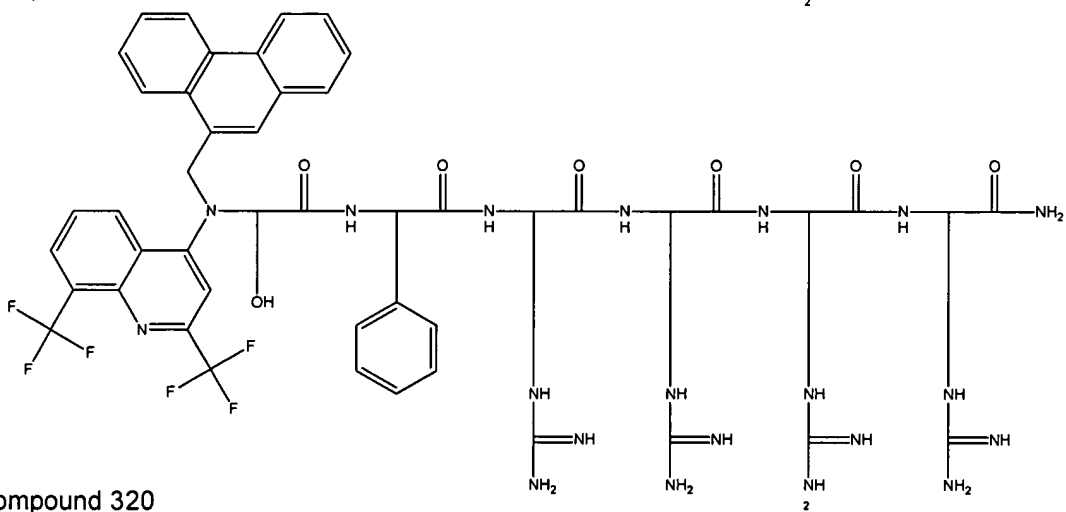


Compound 318

Applicant: David S. Lawrence
Serial No.: 10/755,086
Filed: January 9, 2004
page 137 of 190

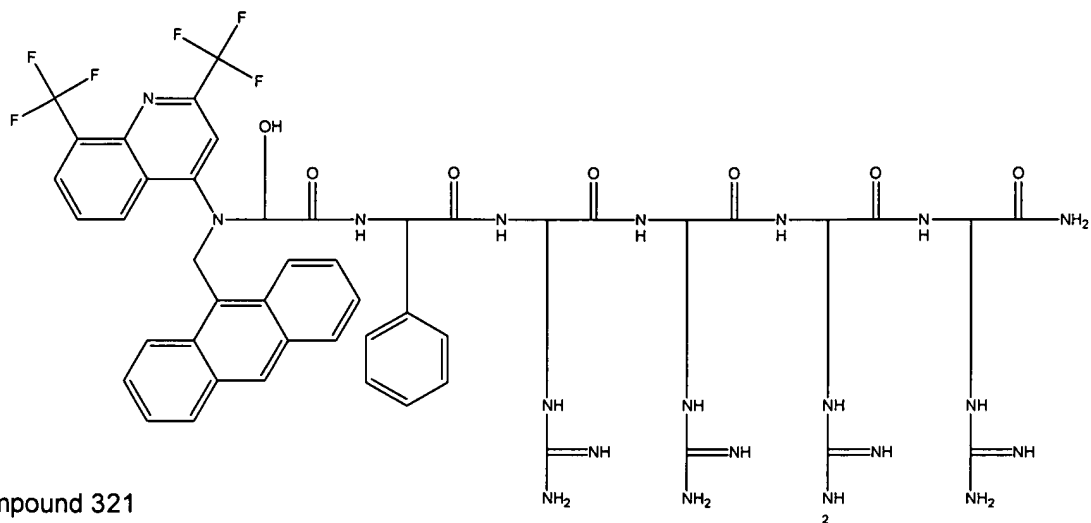


Compound 319

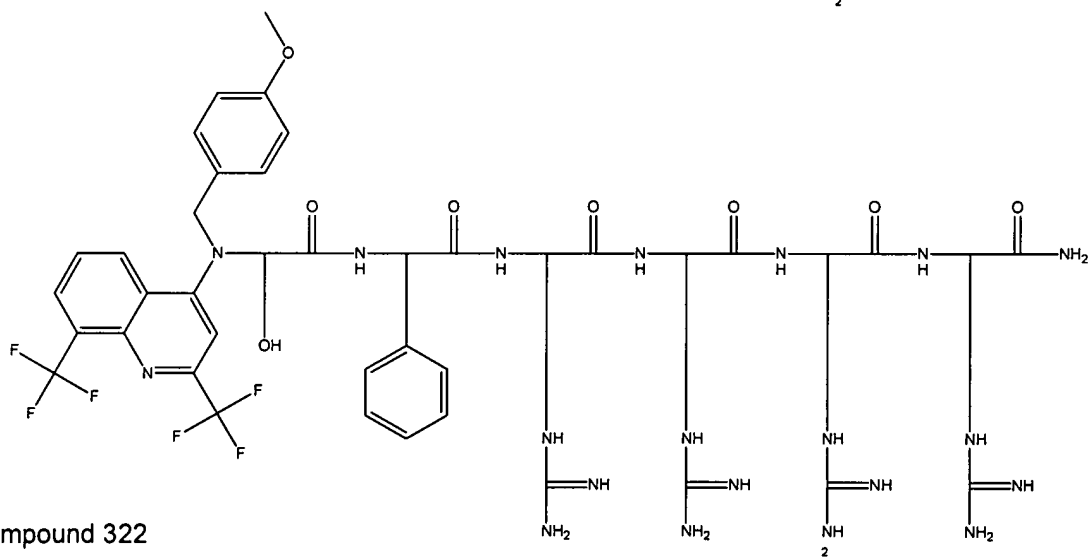


Compound 320

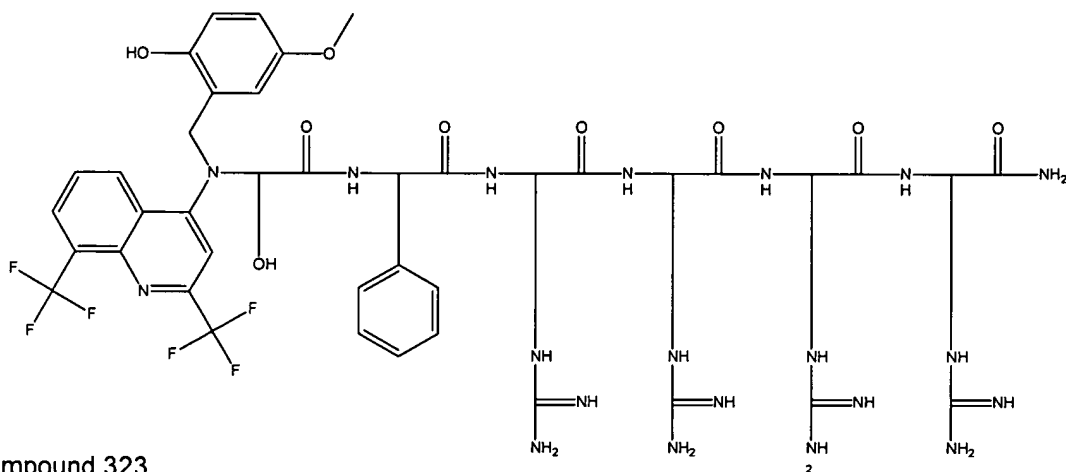
Applicant: David S. Lawrence
Serial No.: 10/755,086
Filed: January 9, 2004
page 138 of 190



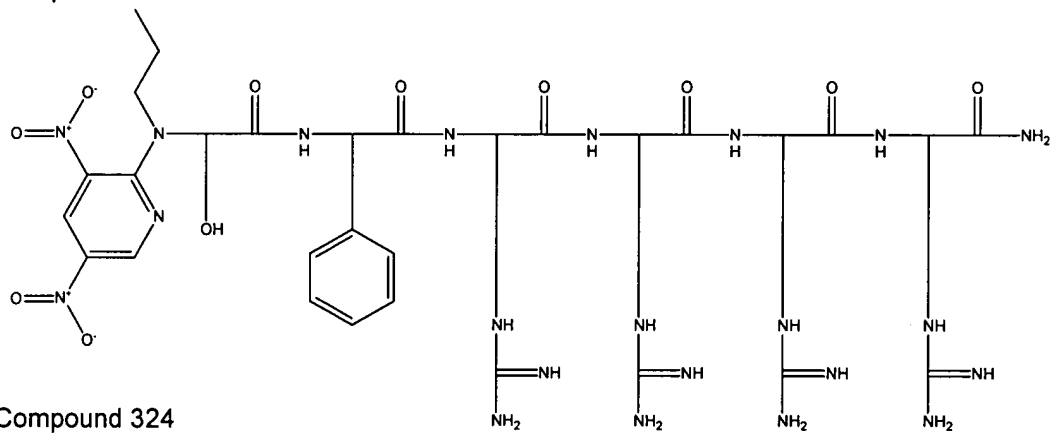
Compound 321



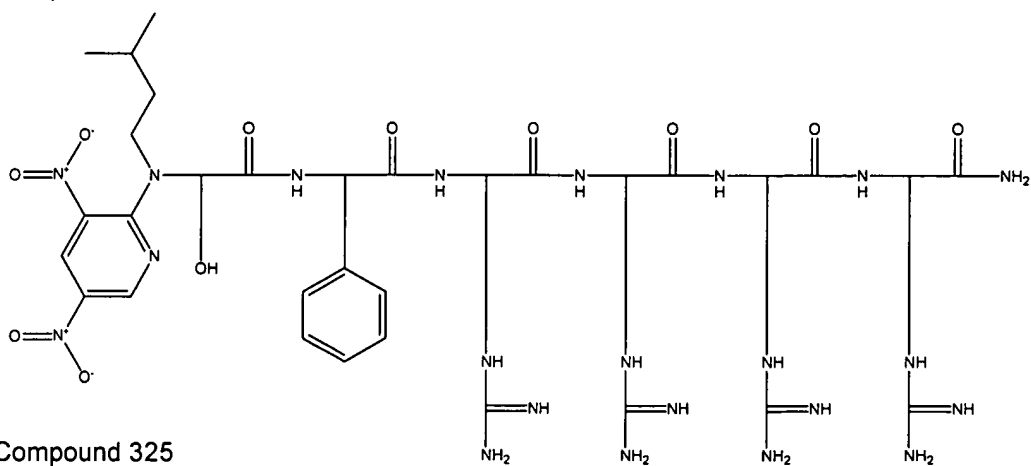
Compound 322



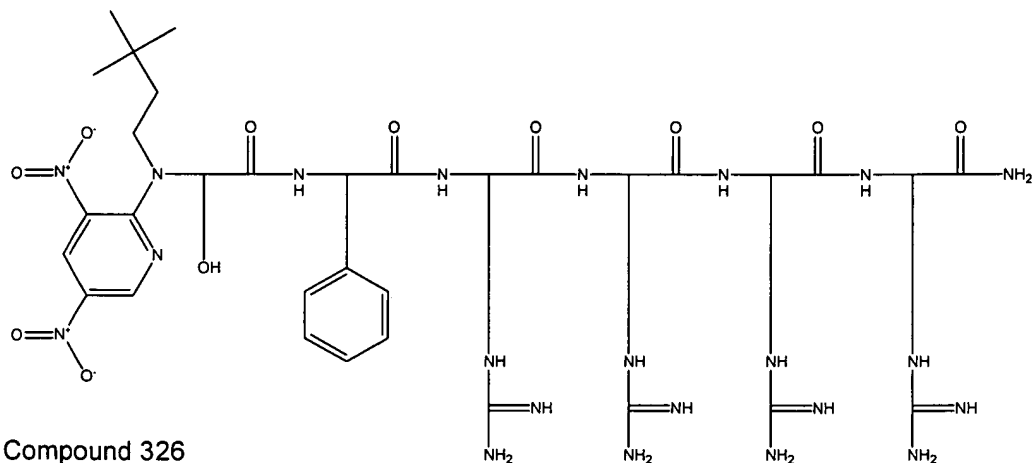
Compound 323



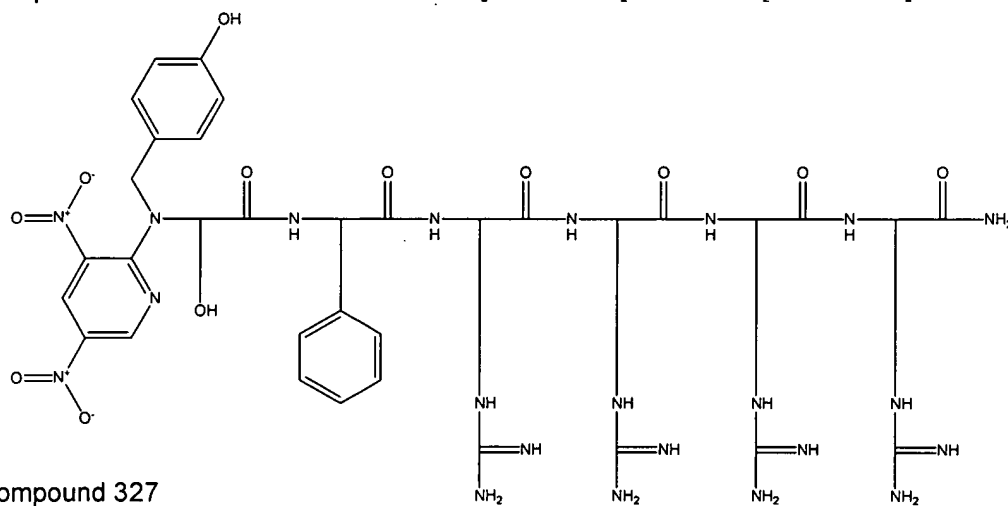
Compound 324



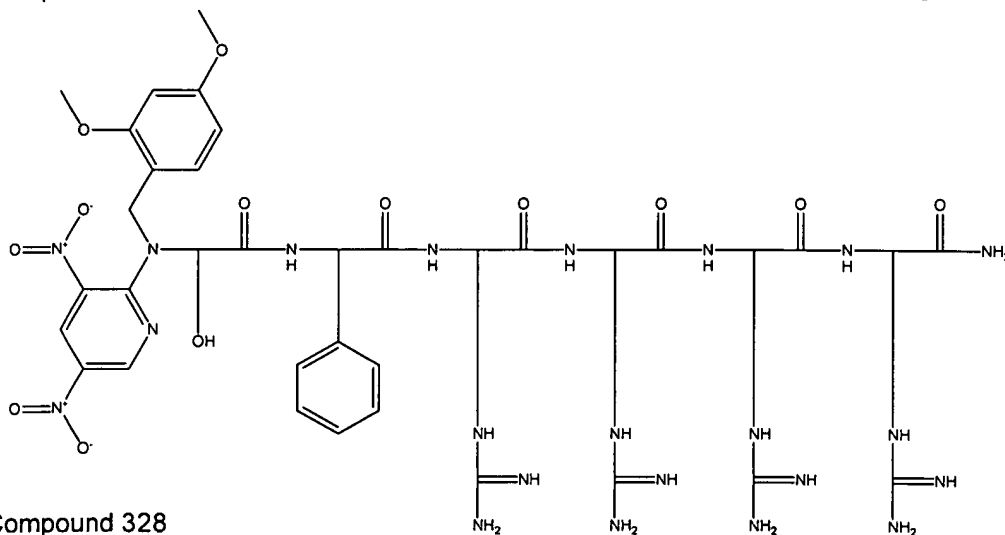
Compound 325



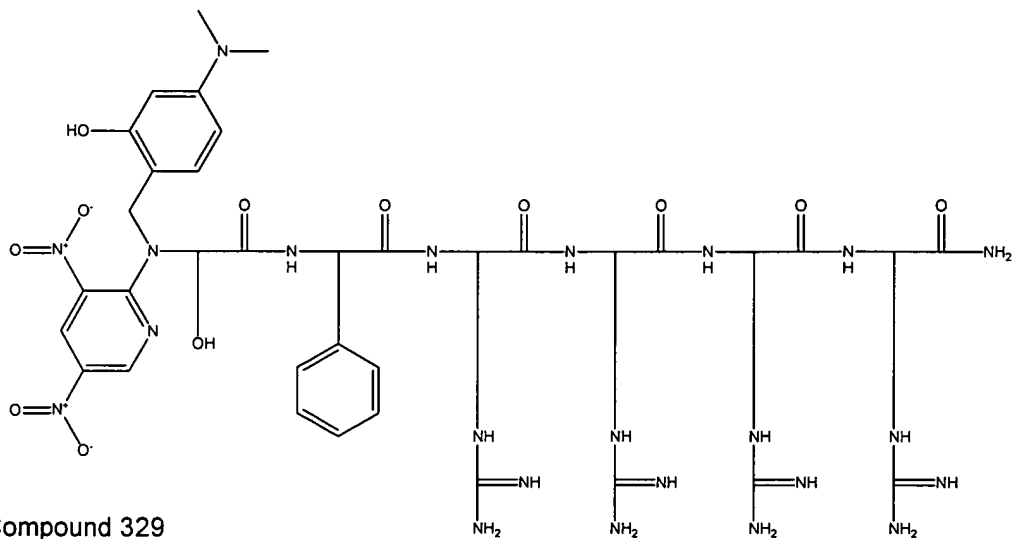
Compound 326



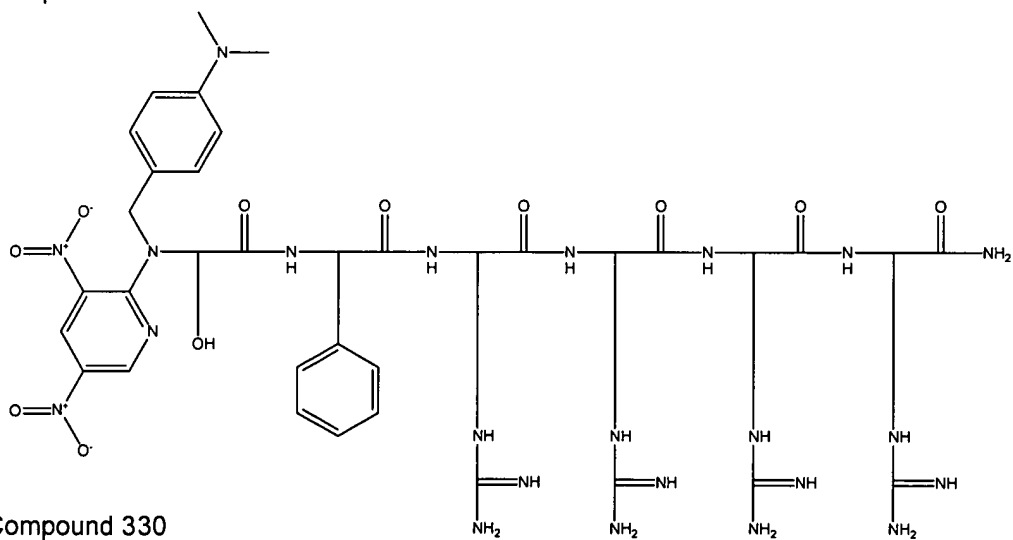
Compound 327



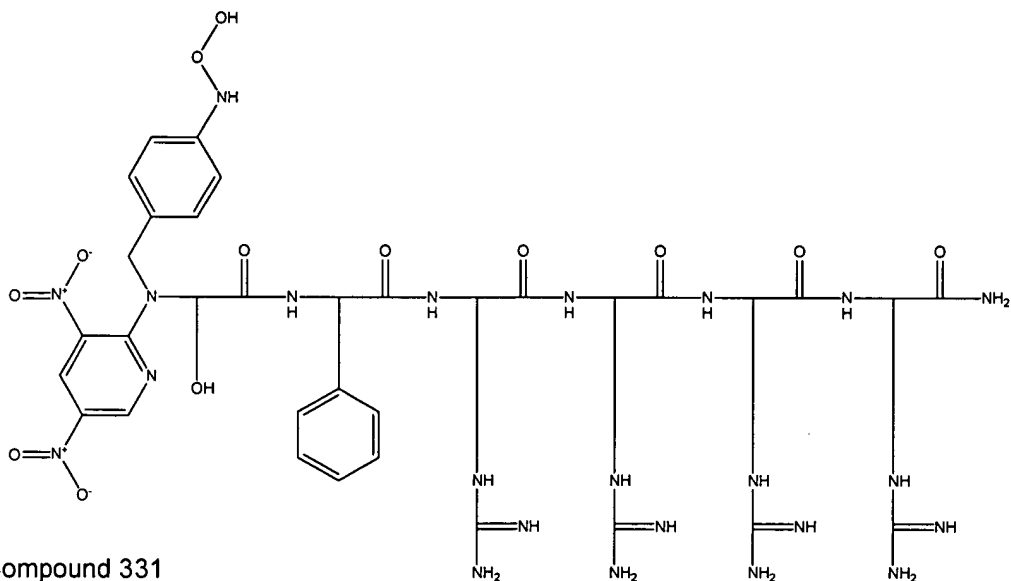
Compound 328



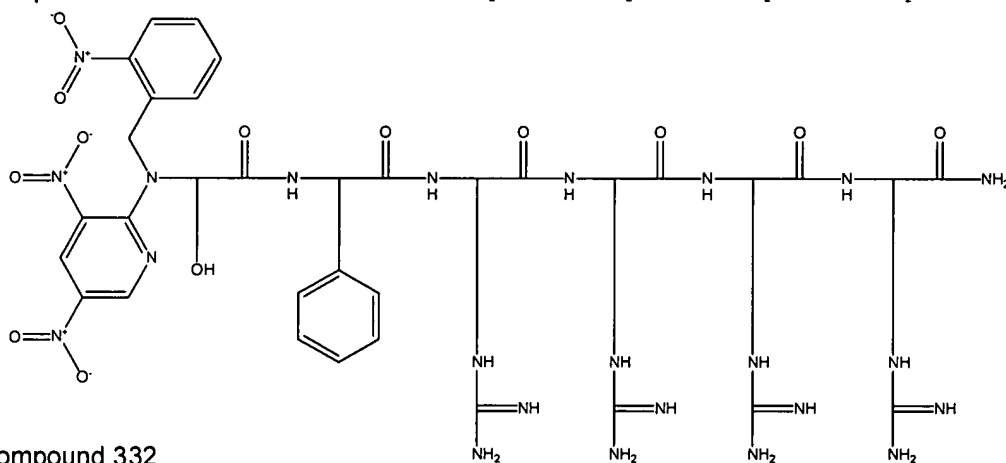
Compound 329



Compound 330

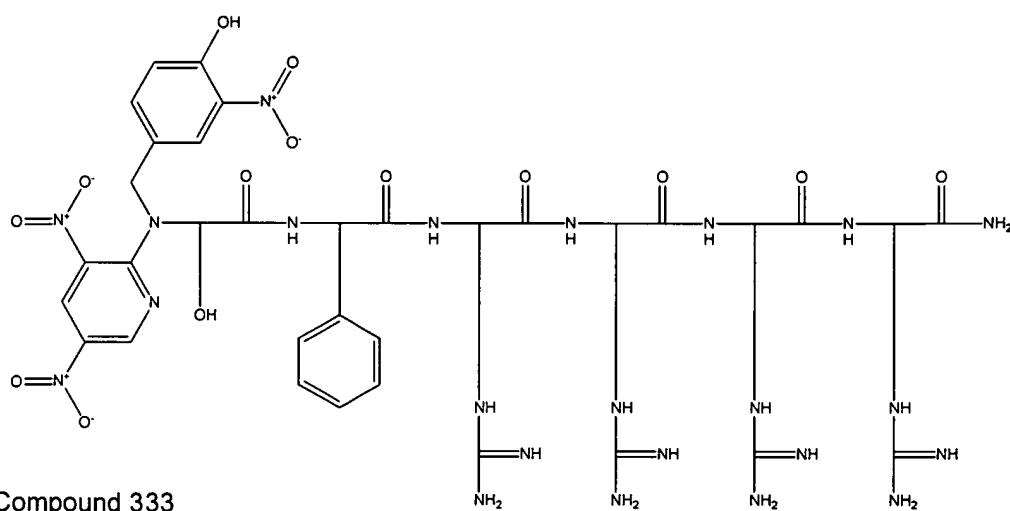


Compound 331

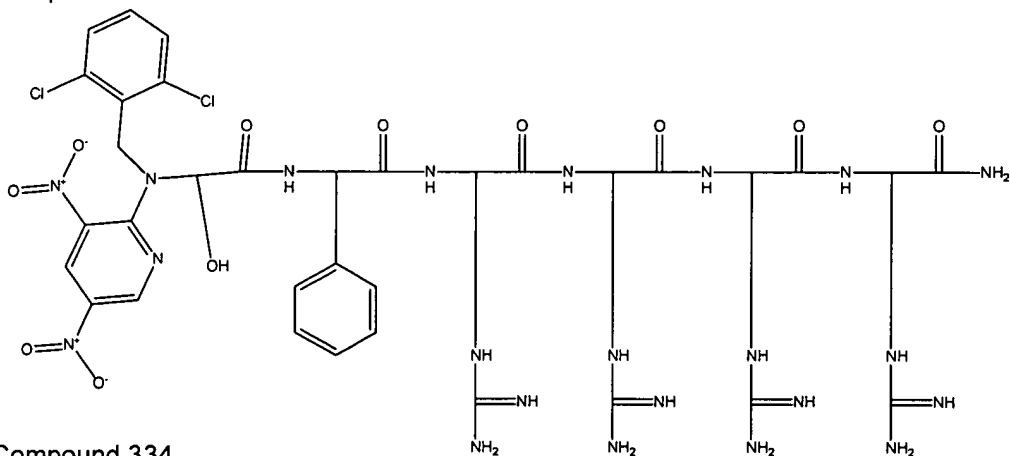


Compound 332

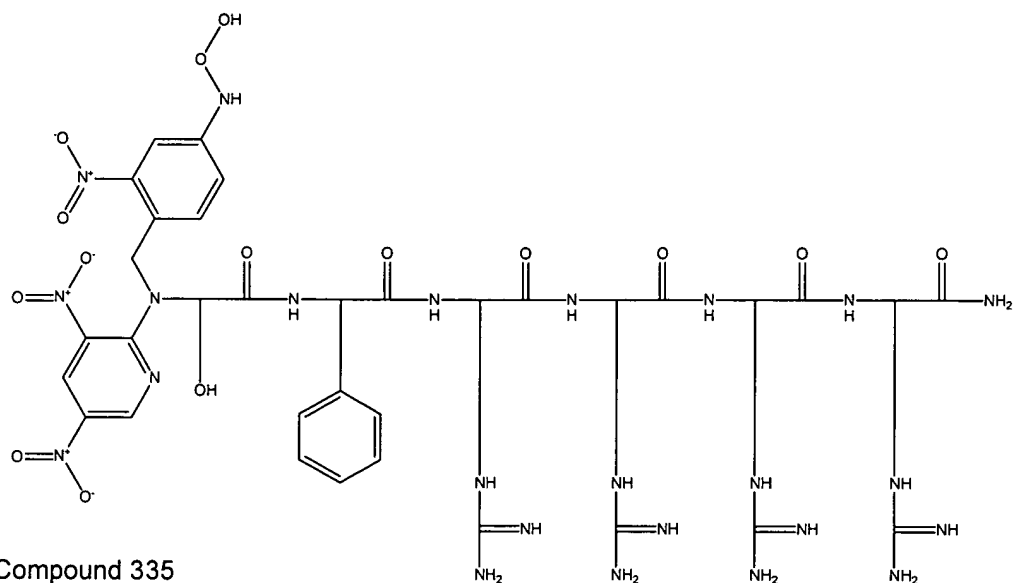
Applicant: David S. Lawrence
Serial No.: 10/755,086
Filed: January 9, 2004
page 143 of 190



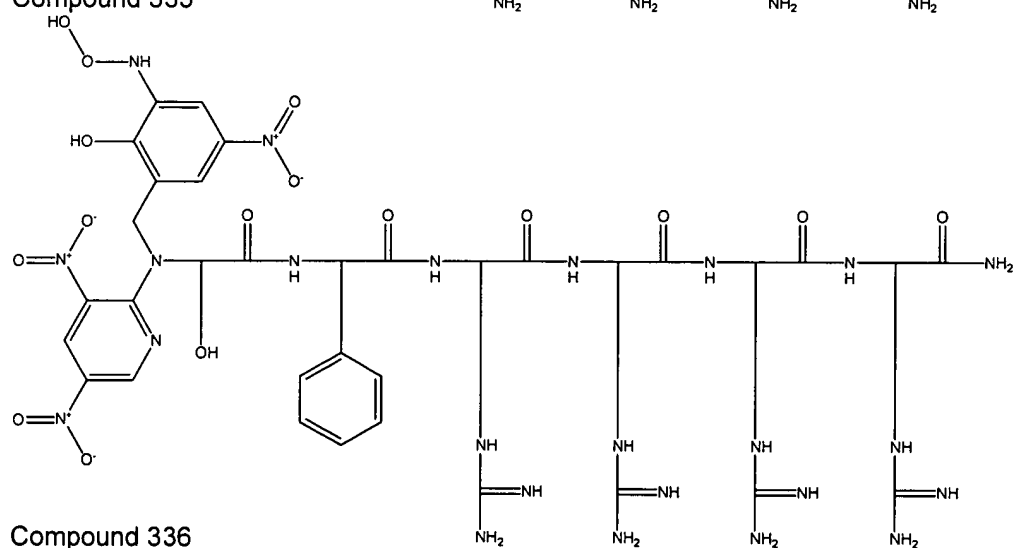
Compound 333



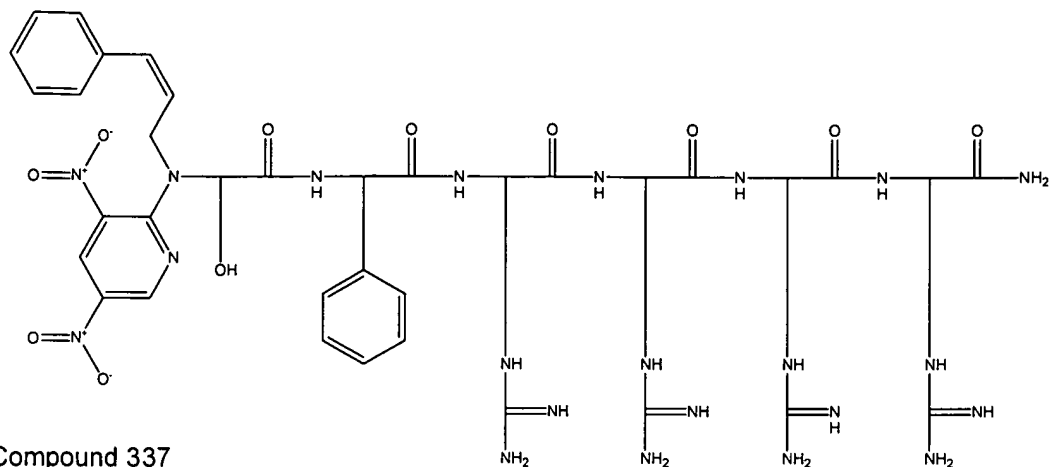
Compound 334



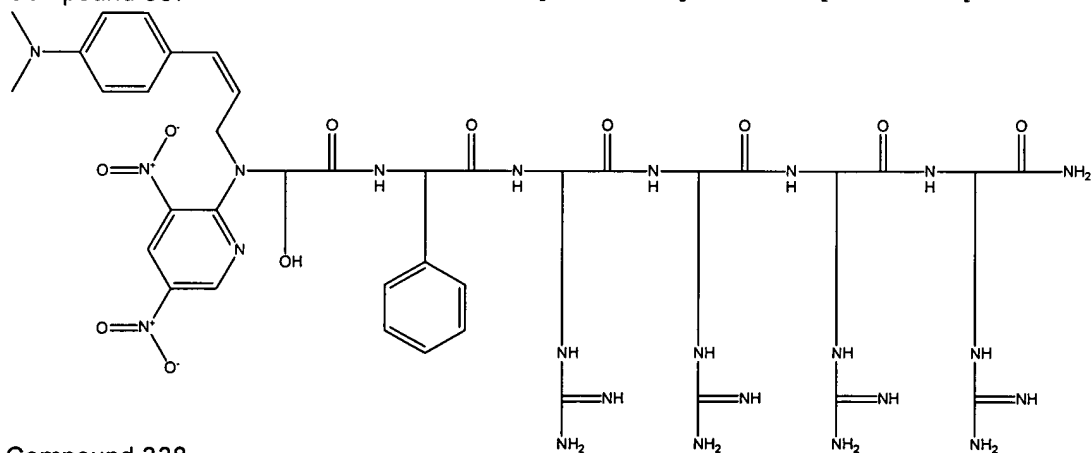
Compound 335



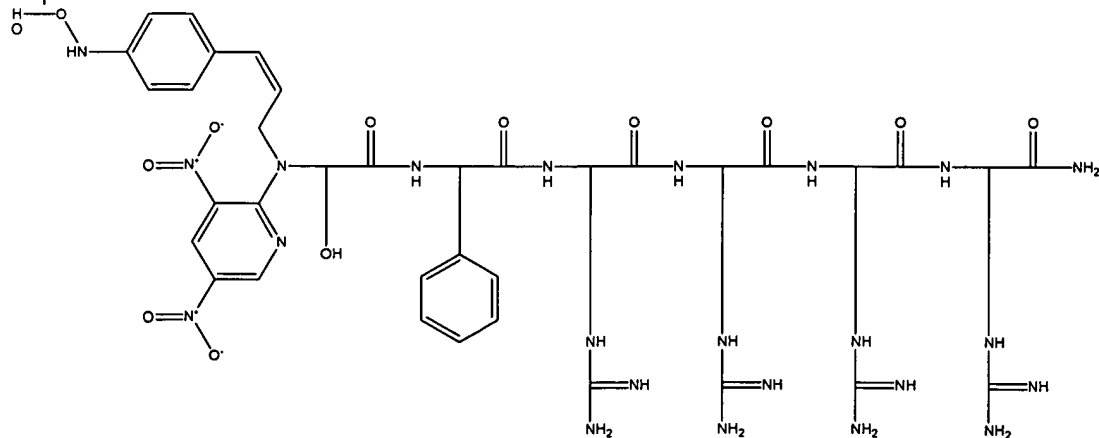
Compound 336



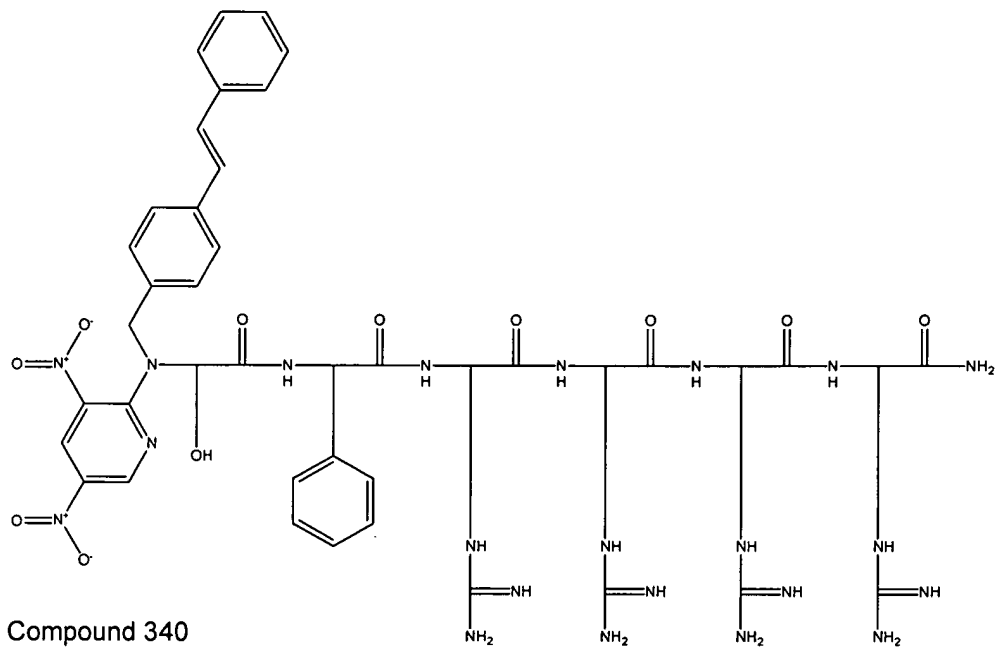
Compound 337



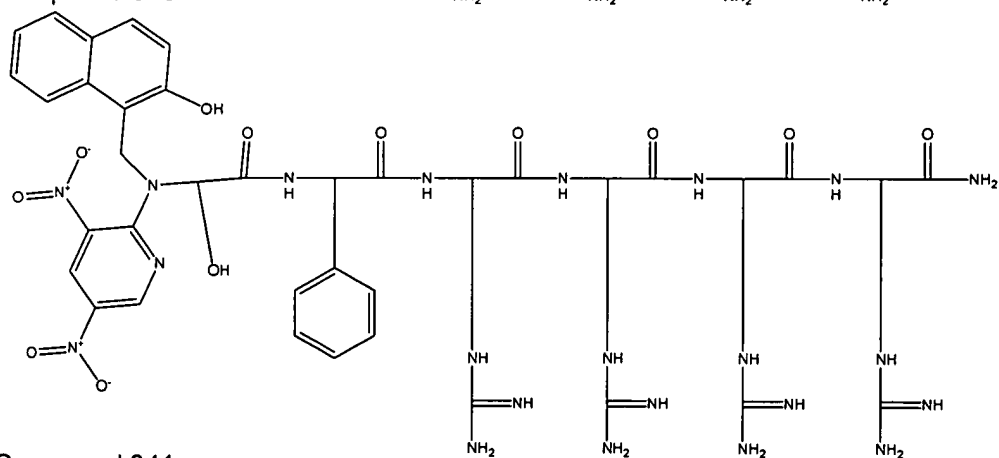
Compound 338



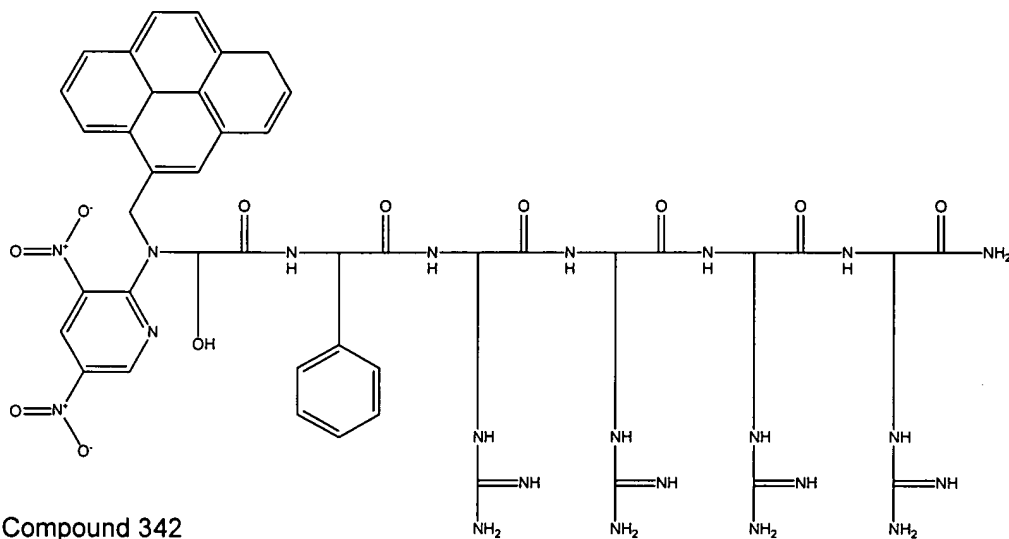
Compound 339



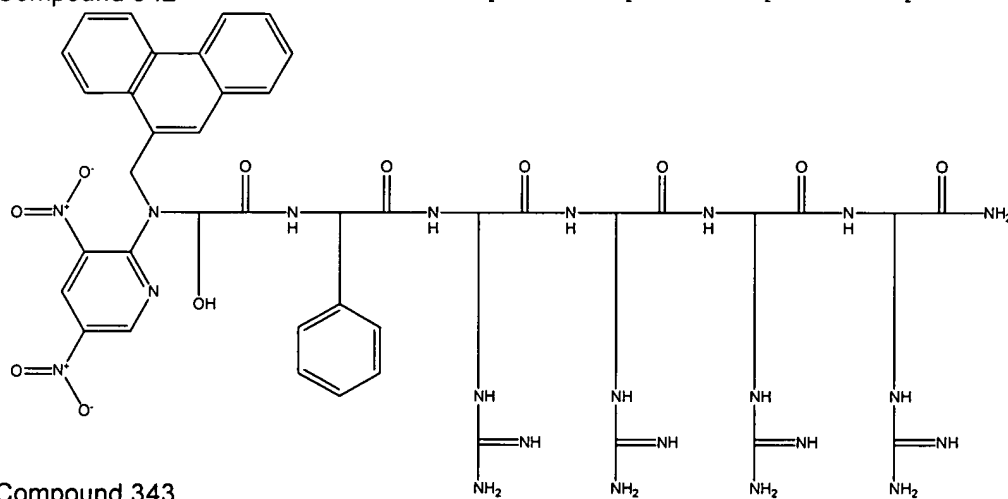
Compound 340



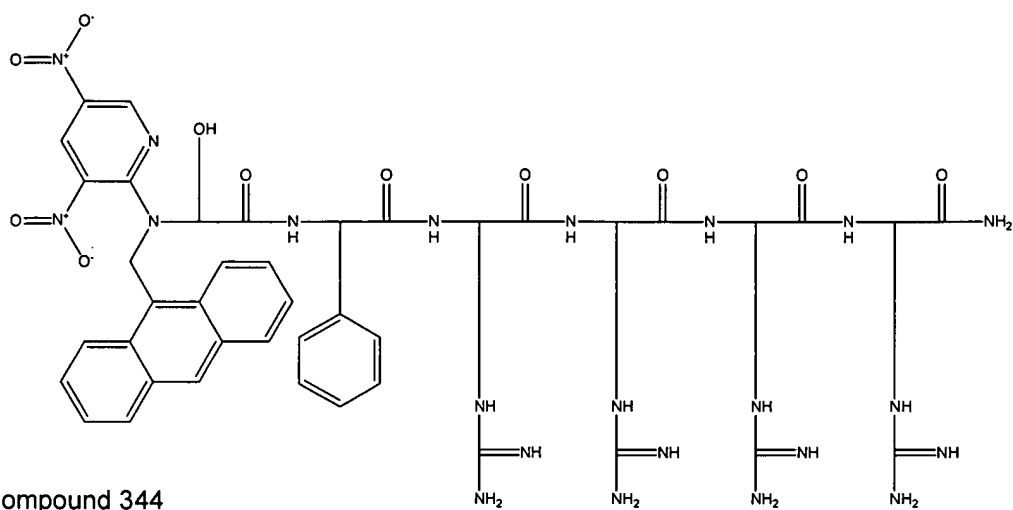
Compound 341



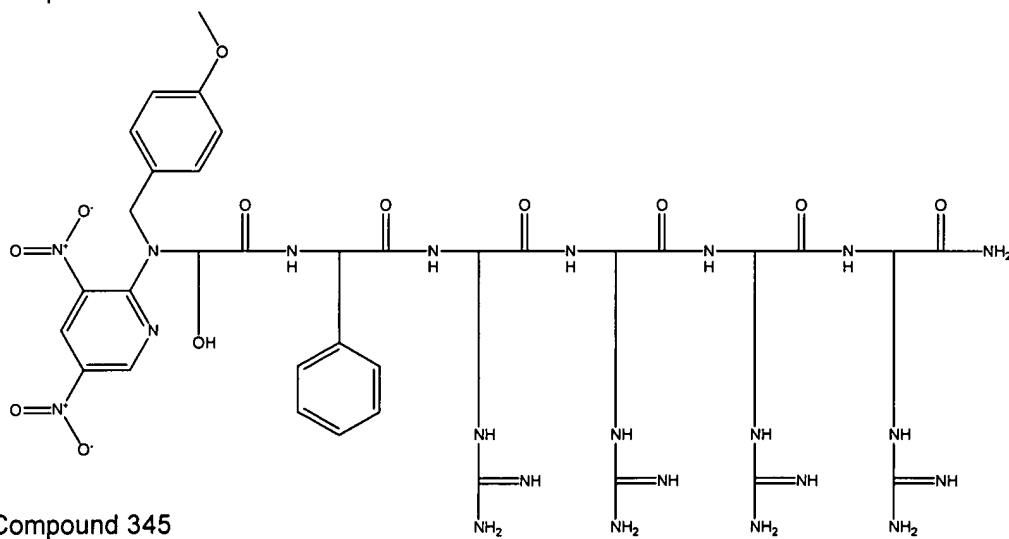
Compound 342



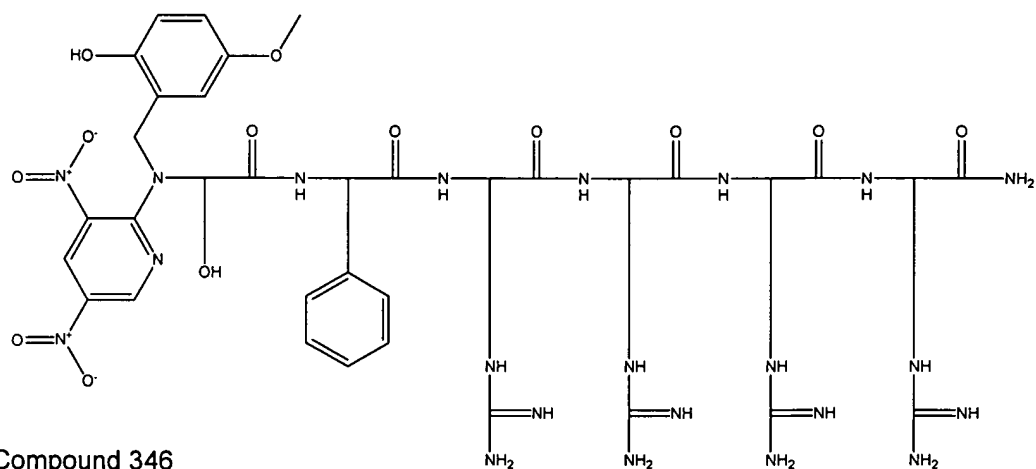
Compound 343



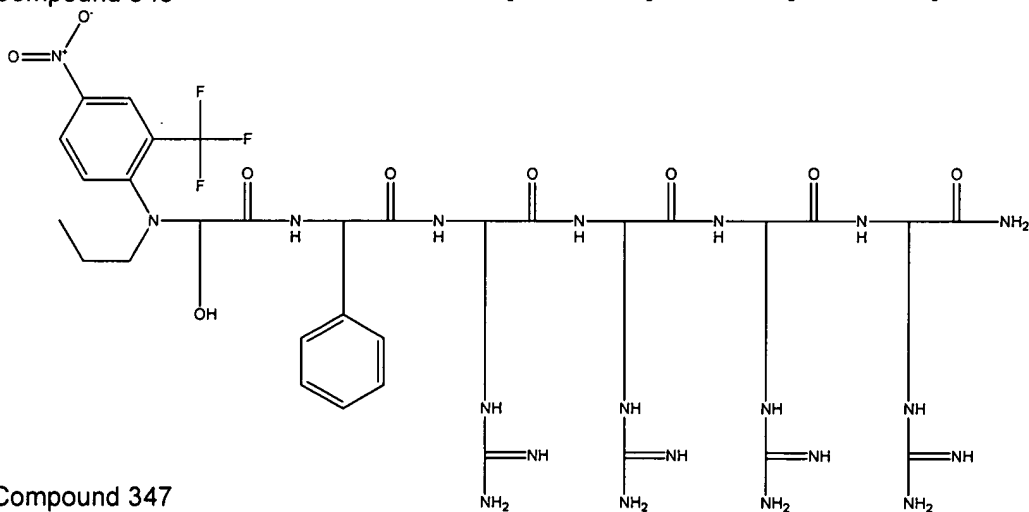
Compound 344



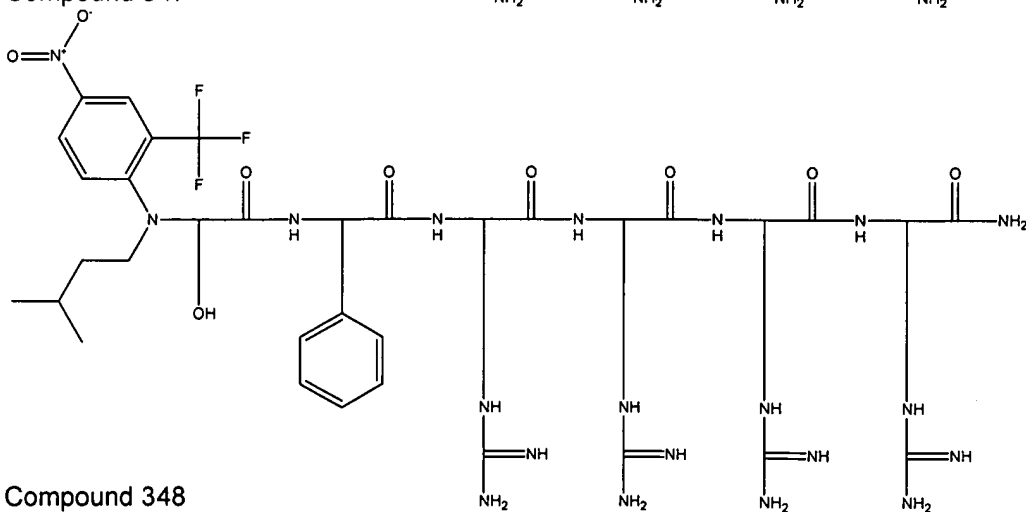
Compound 345



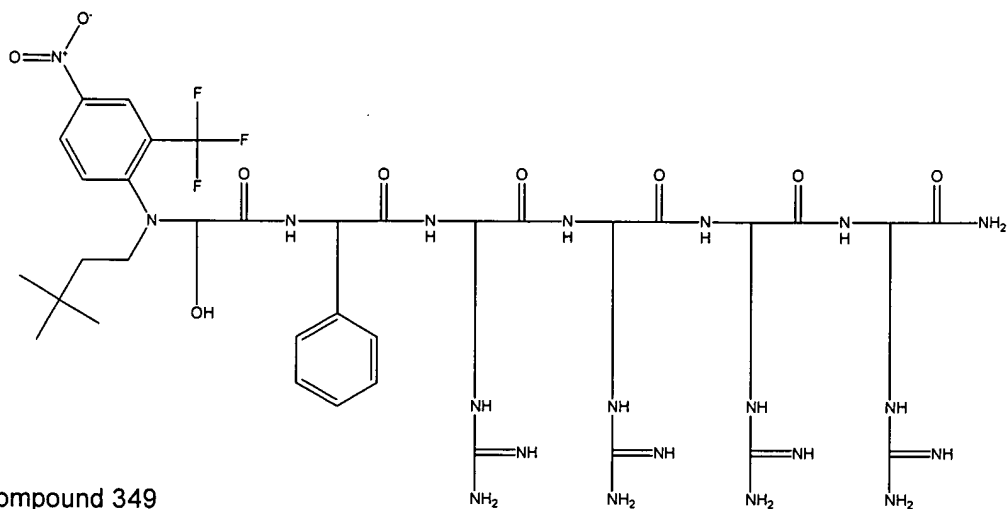
Compound 346



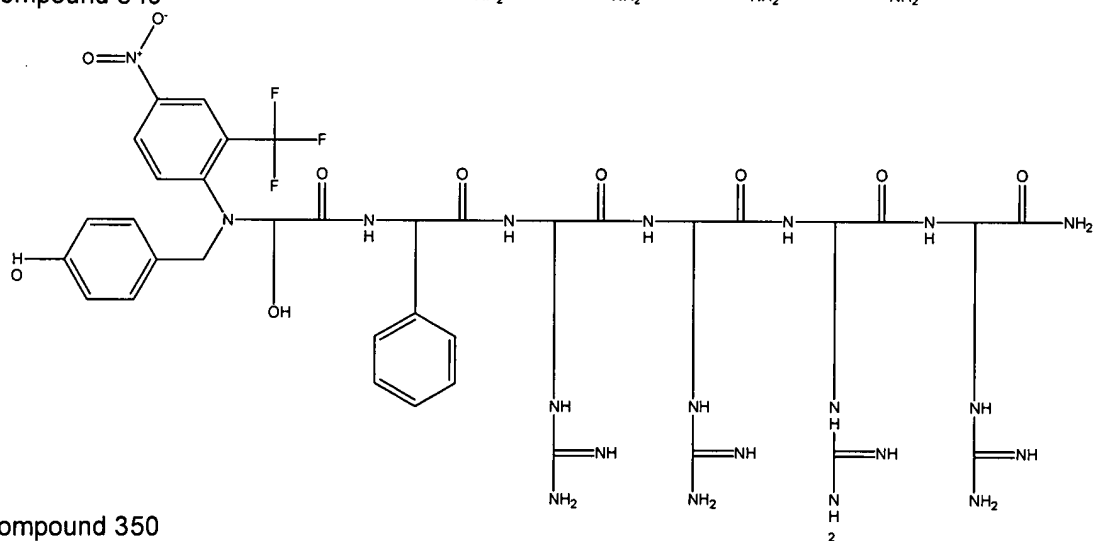
Compound 347



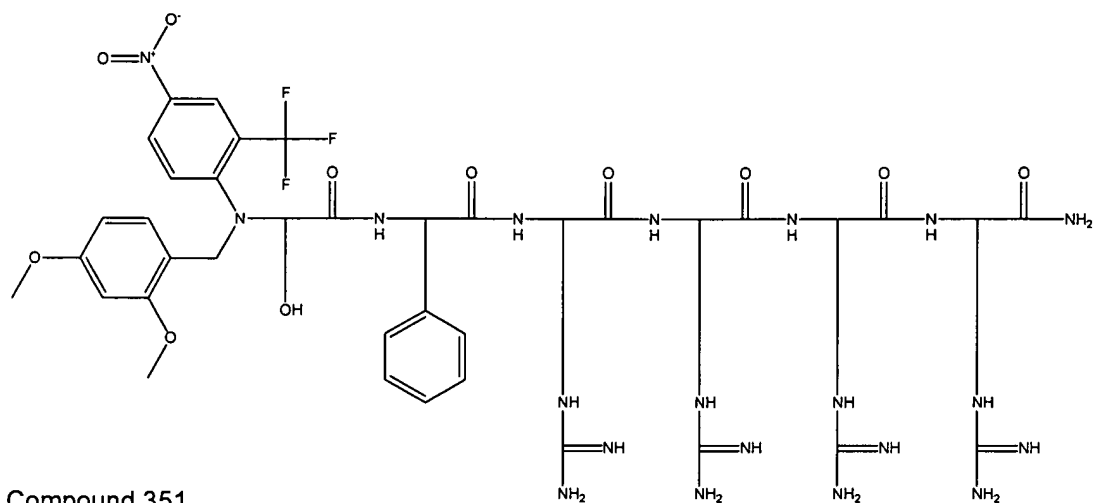
Compound 348



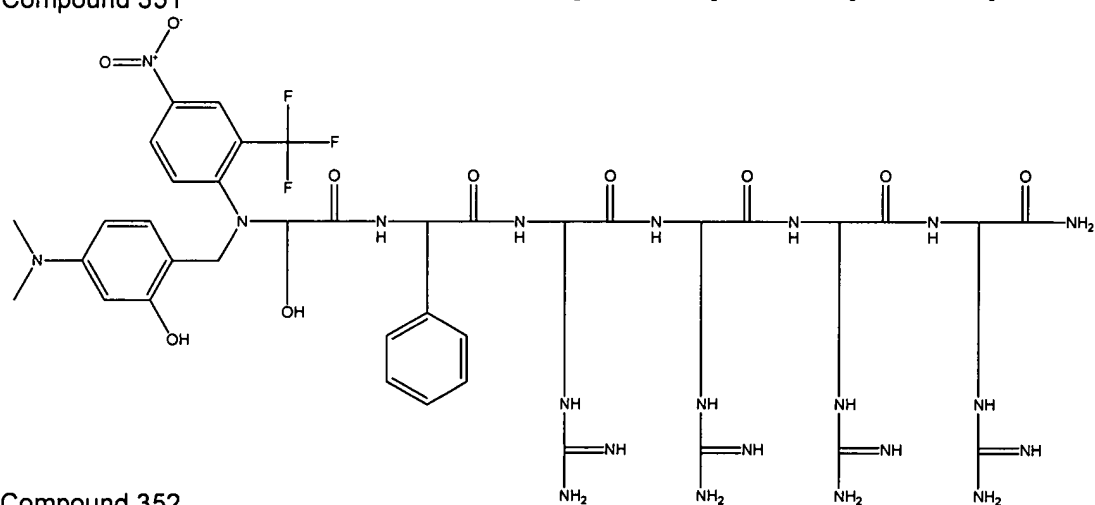
Compound 349



Compound 350



Compound 351



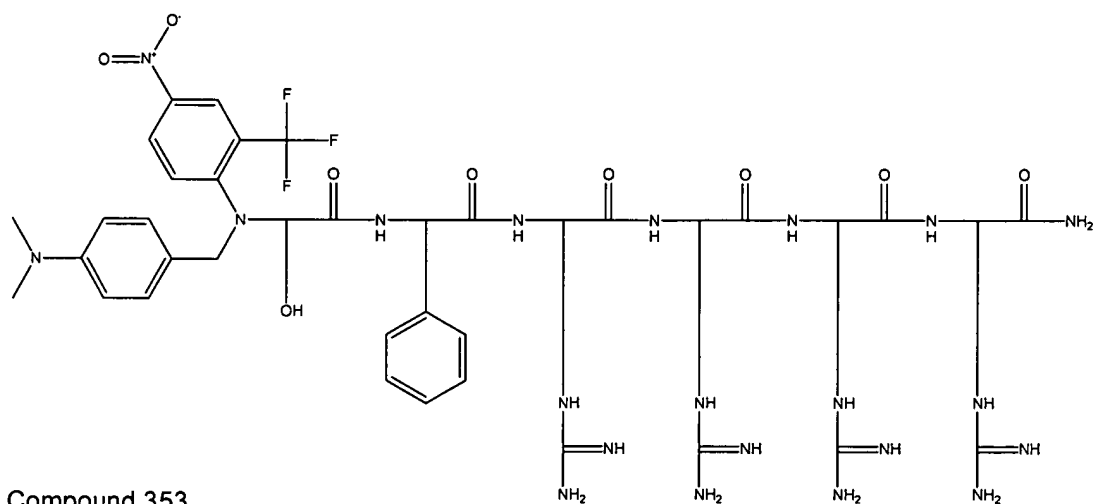
Compound 352

Applicant: David S. Lawrence

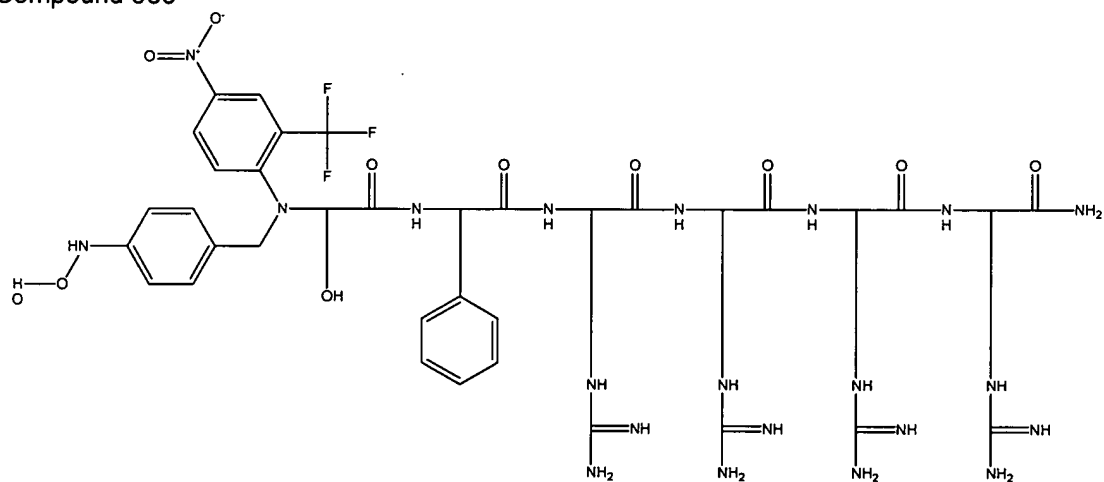
Serial No.: 10/755,086

Filed: January 9, 2004

page 152 of 190

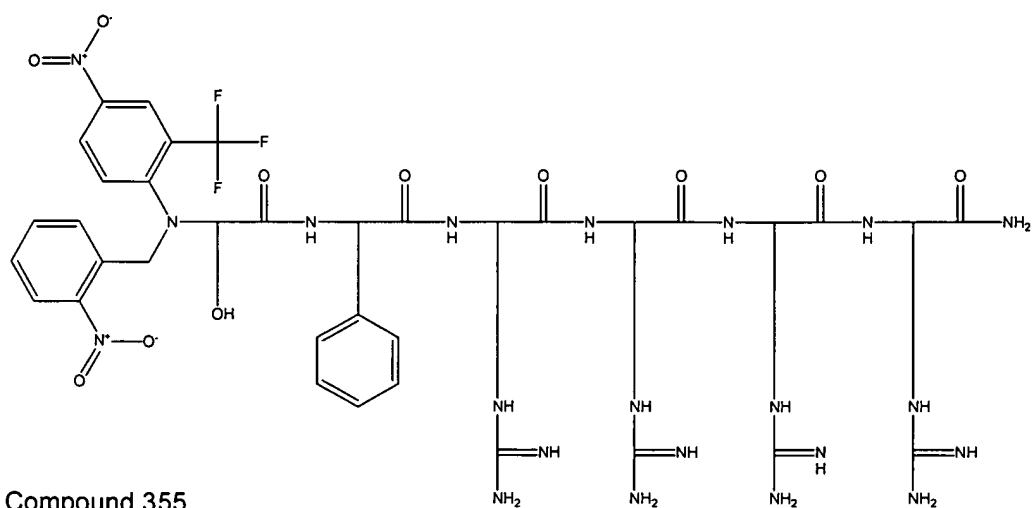


Compound 353

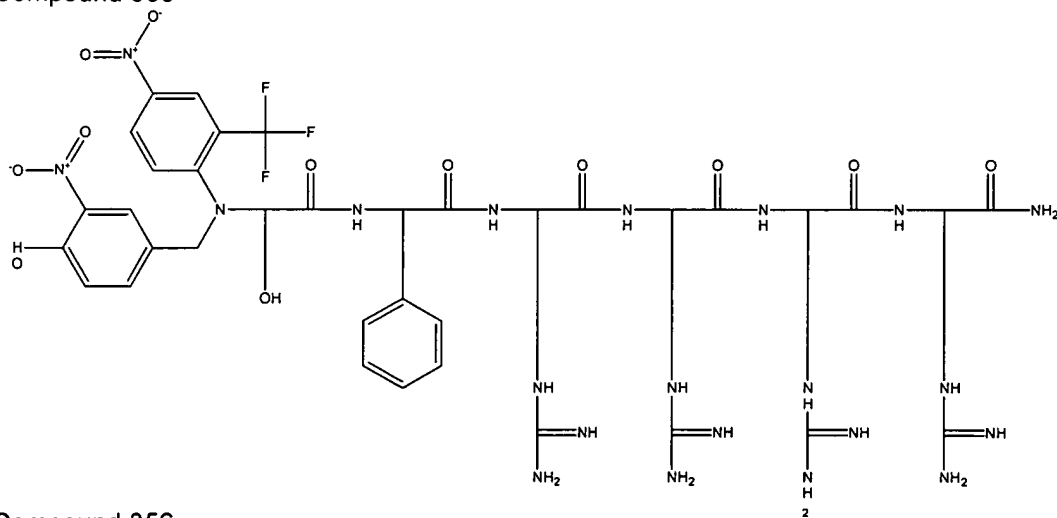


Compound 354

Applicant: David S. Lawrence
Serial No.: 10/755,086
Filed: January 9, 2004
page 153 of 190

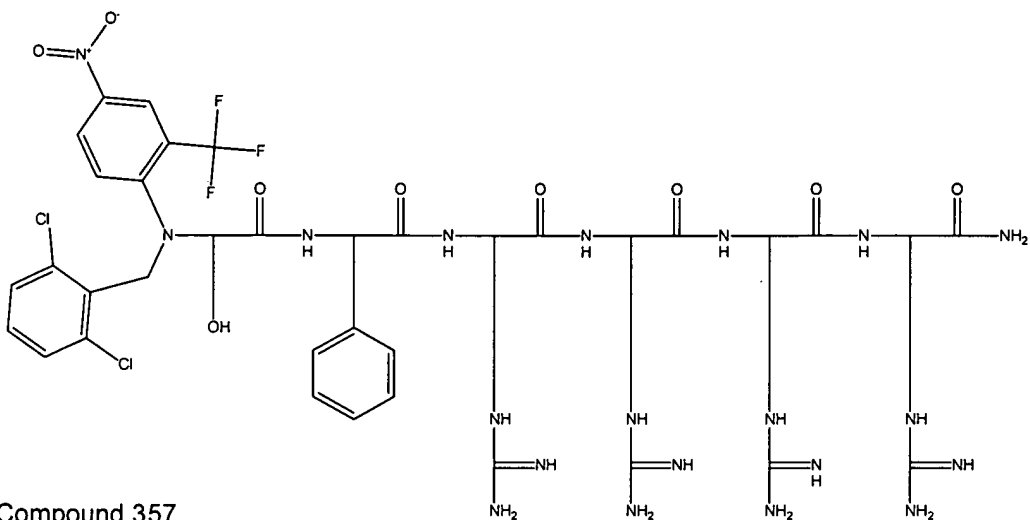


Compound 355

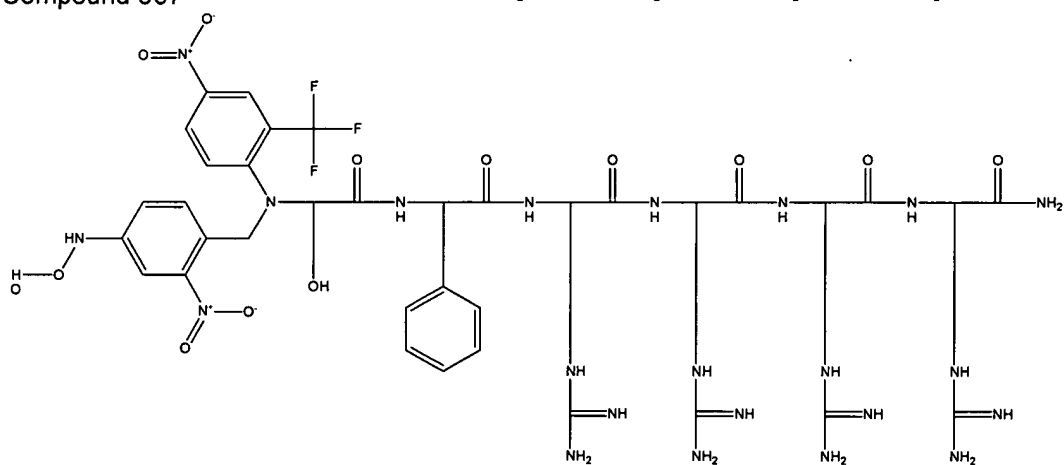


Compound 356

Applicant: David S. Lawrence
Serial No.: 10/755,086
Filed: January 9, 2004
page 154 of 190



Compound 357



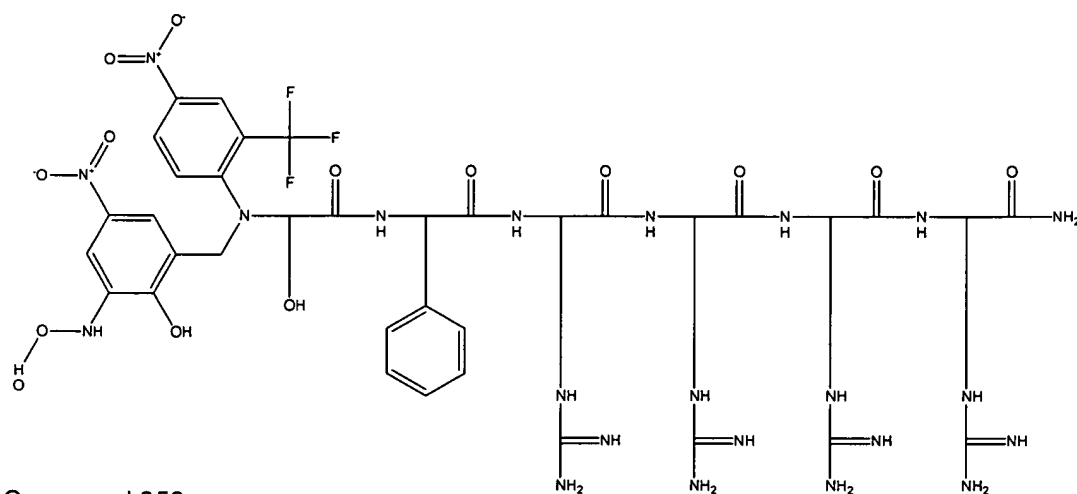
Compound 358

Applicant: David S. Lawrence

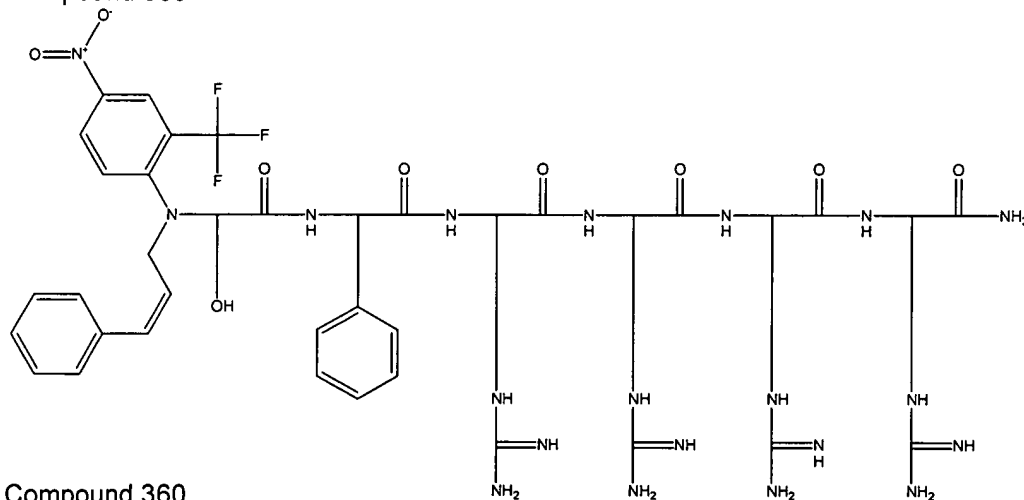
Serial No.: 10/755,086

Filed: January 9, 2004

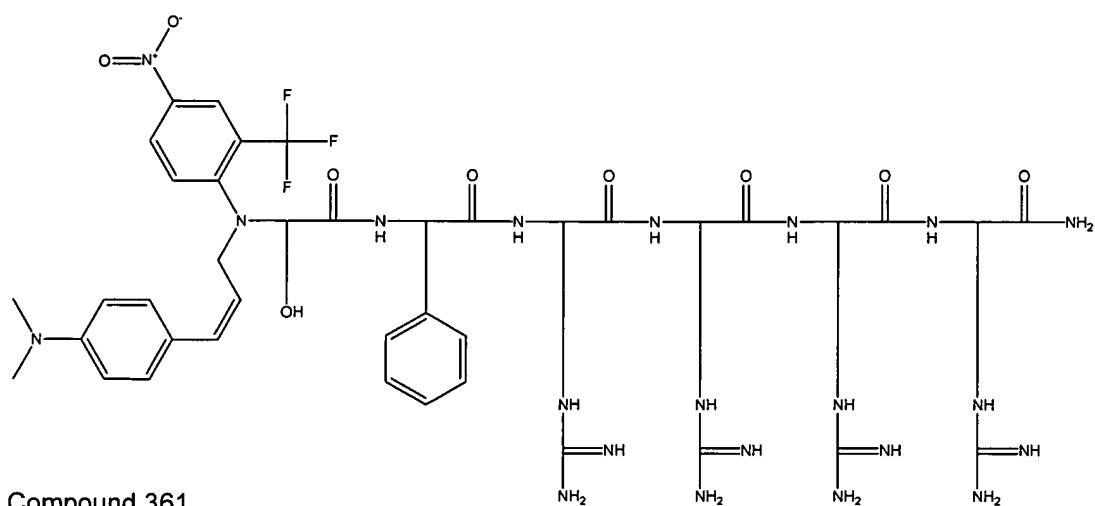
page 155 of 190



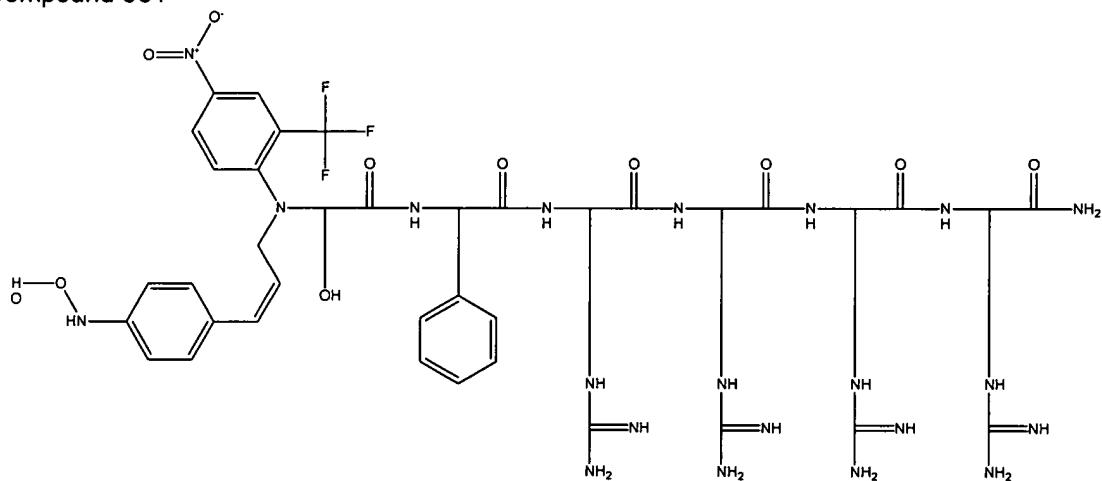
Compound 359



Compound 360

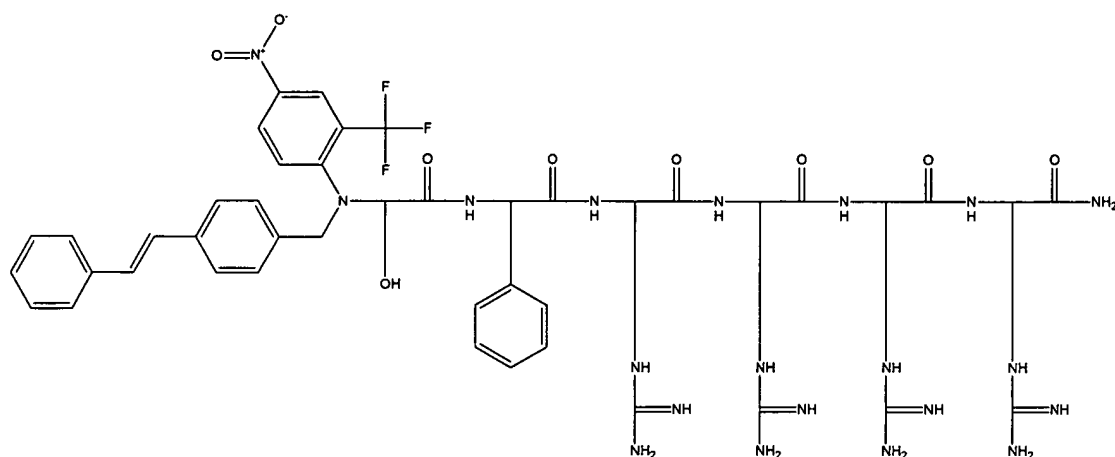


Compound 361

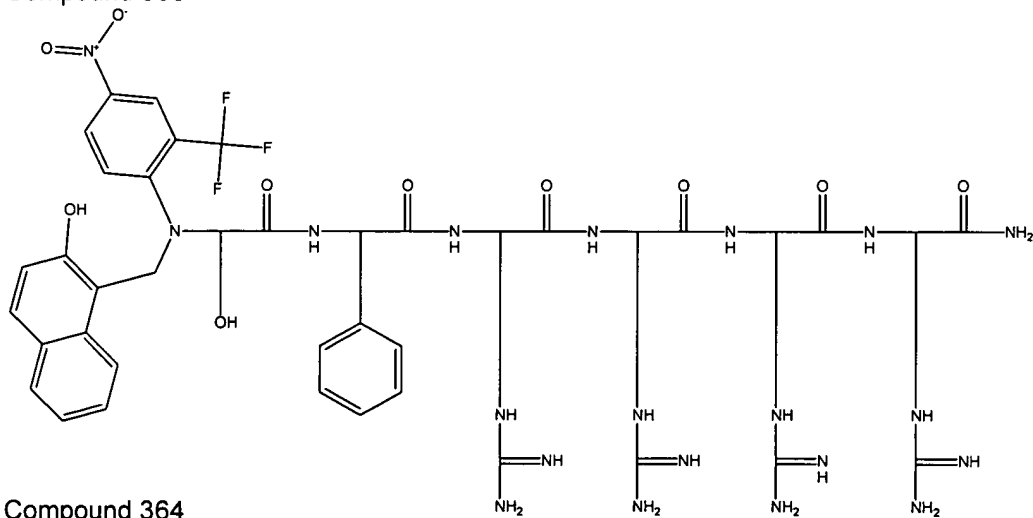


Compound 362

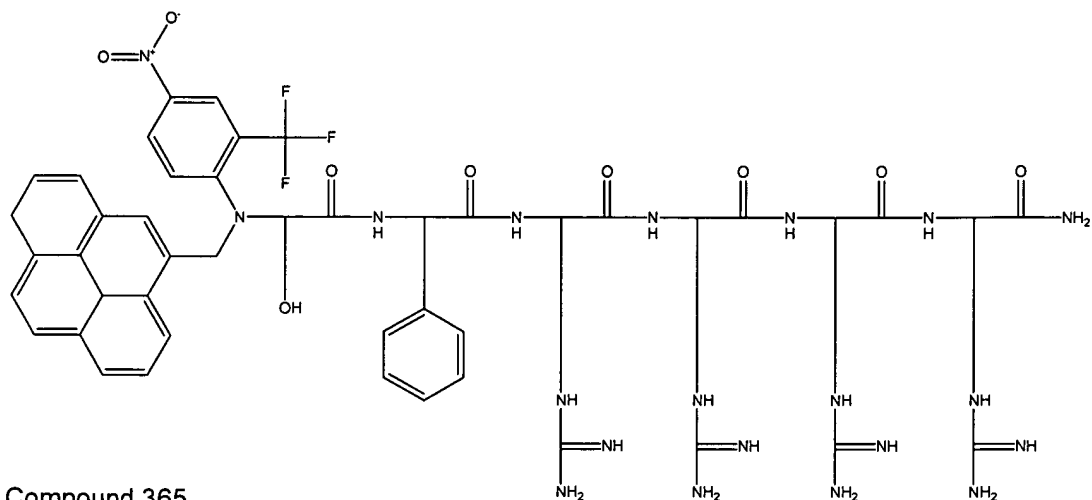
Applicant: David S. Lawrence
Serial No.: 10/755,086
Filed: January 9, 2004
page 157 of 190



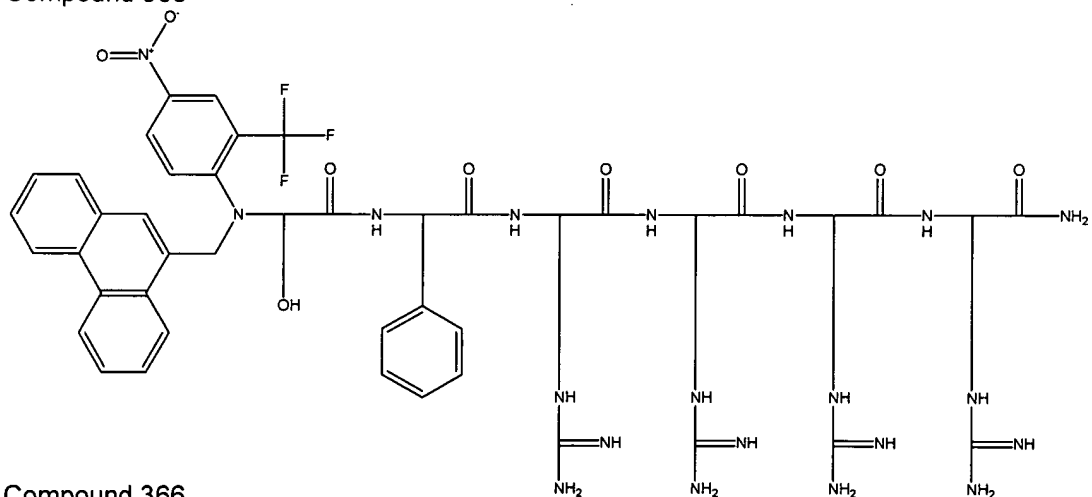
Compound 363



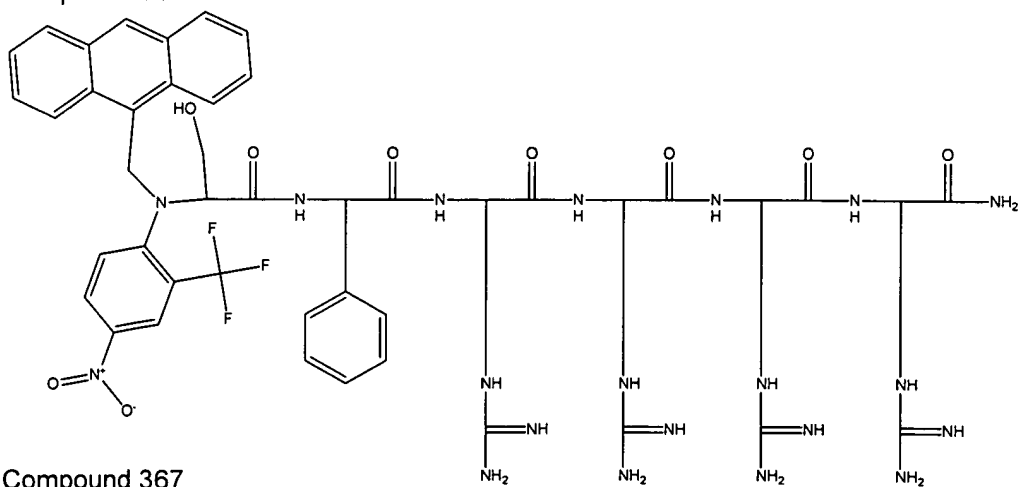
Compound 364



Compound 365



Compound 366



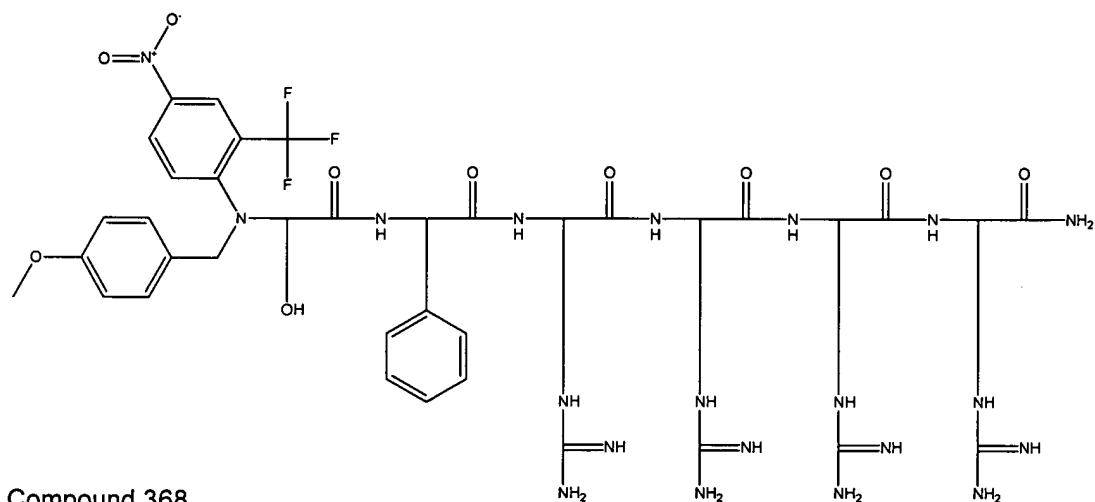
Compound 367

Applicant: David S. Lawrence

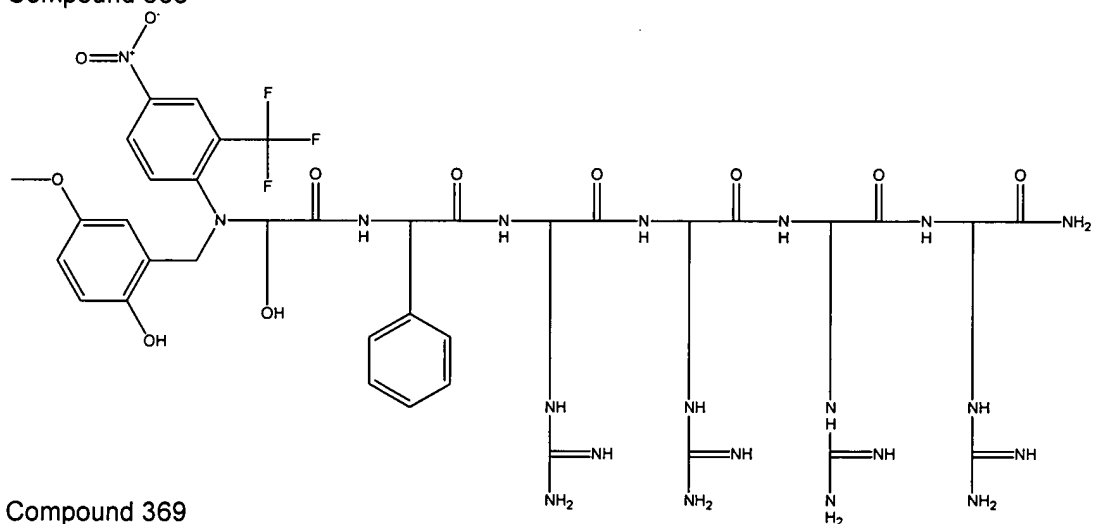
Serial No.: 10/755,086

Filed: January 9, 2004

page 159 of 190

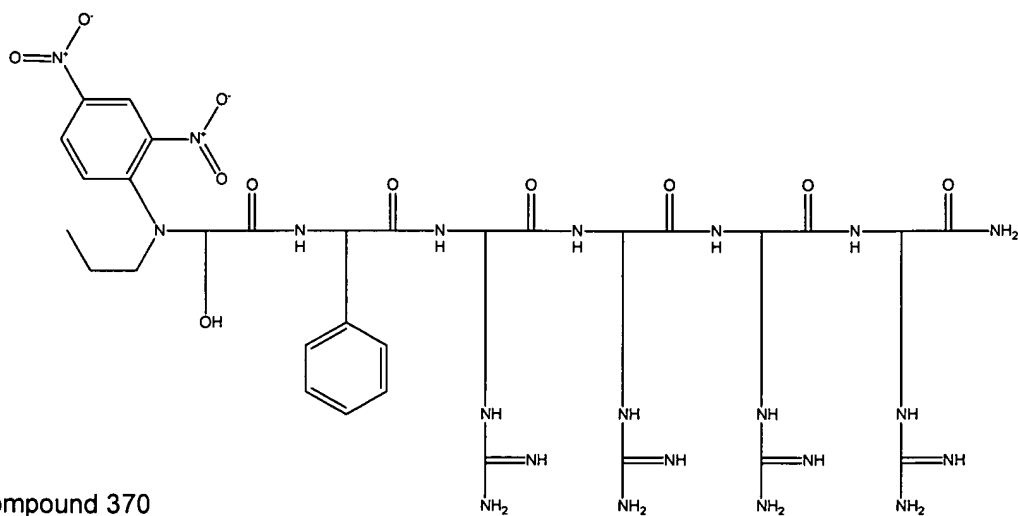


Compound 368

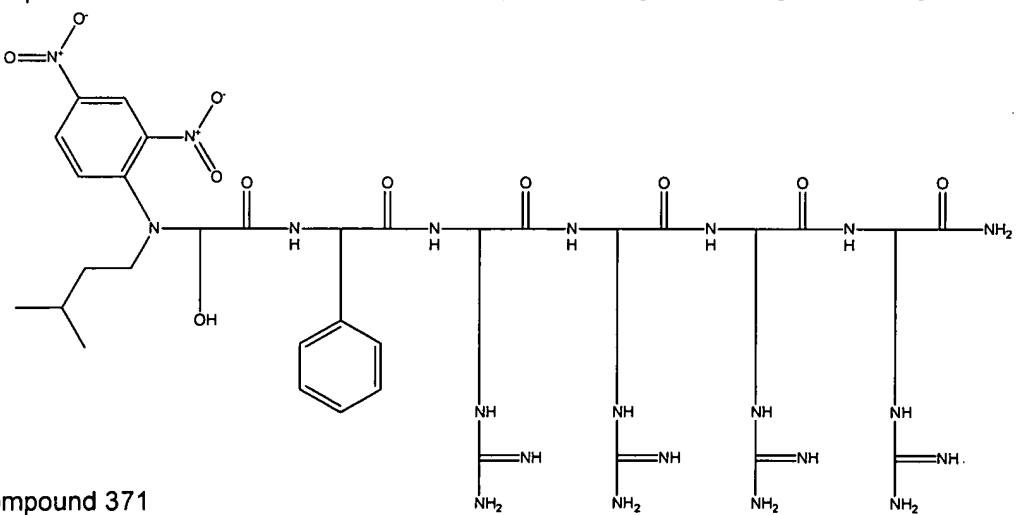


Compound 369

Applicant: David S. Lawrence
Serial No.: 10/755,086
Filed: January 9, 2004
page 160 of 190

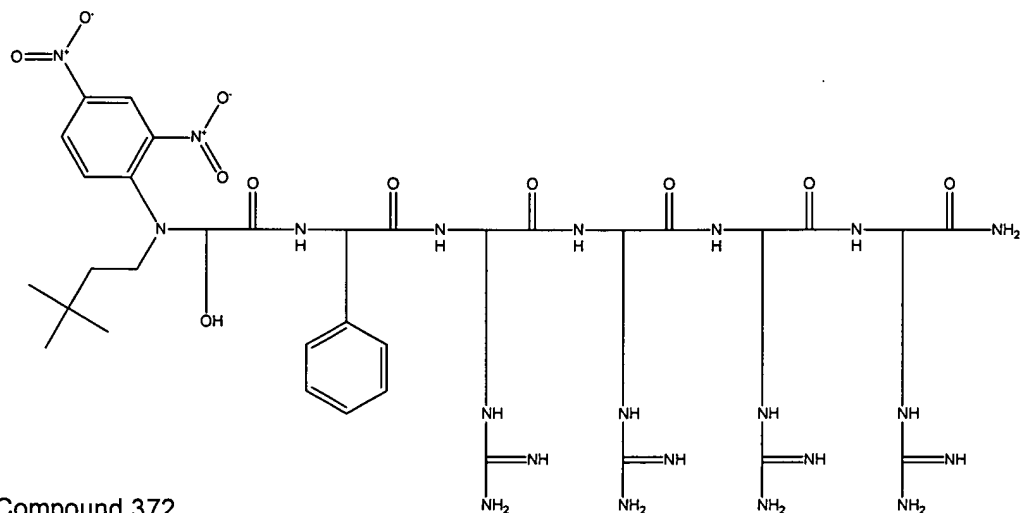


Compound 370

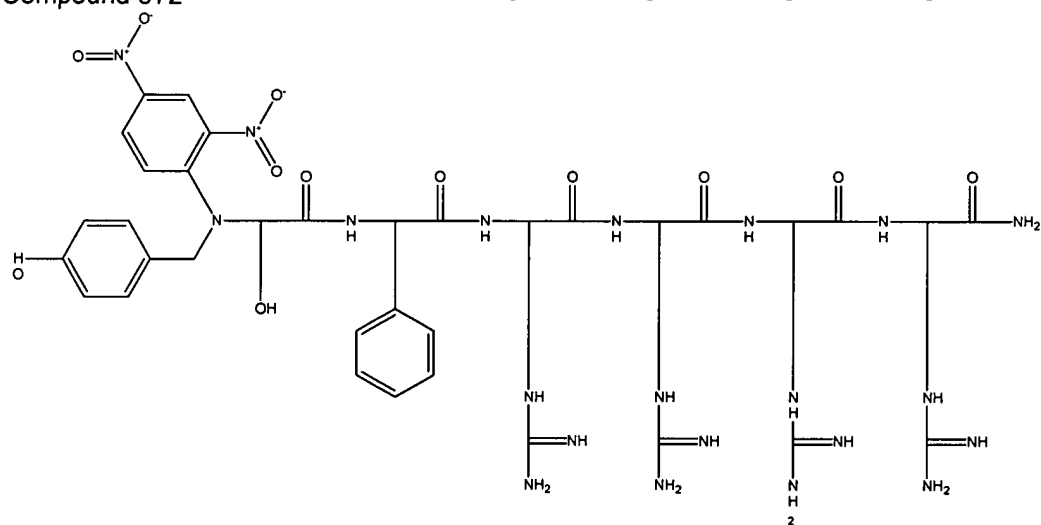


Compound 371

Applicant: David S. Lawrence
Serial No.: 10/755,086
Filed: January 9, 2004
page 161 of 190

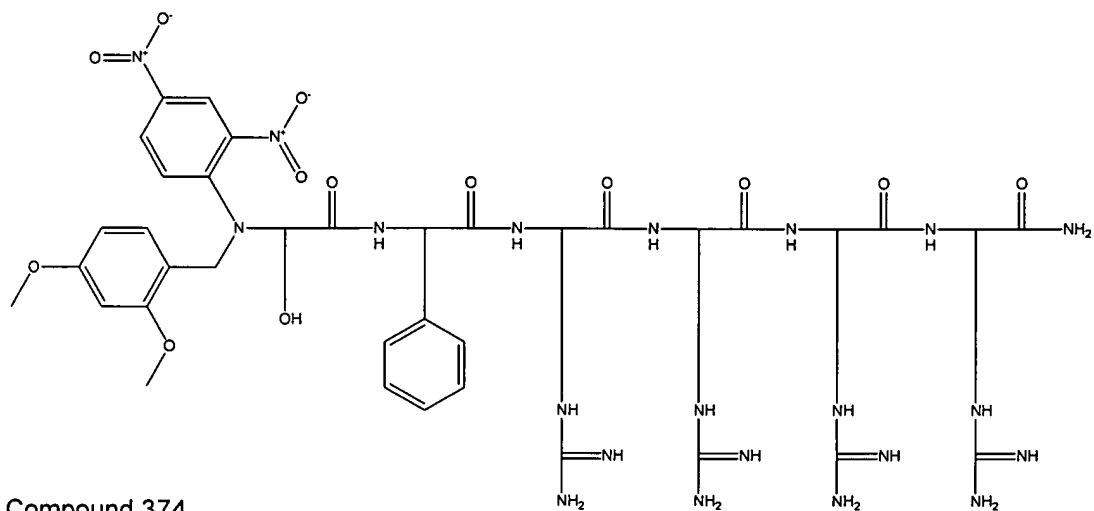


Compound 372

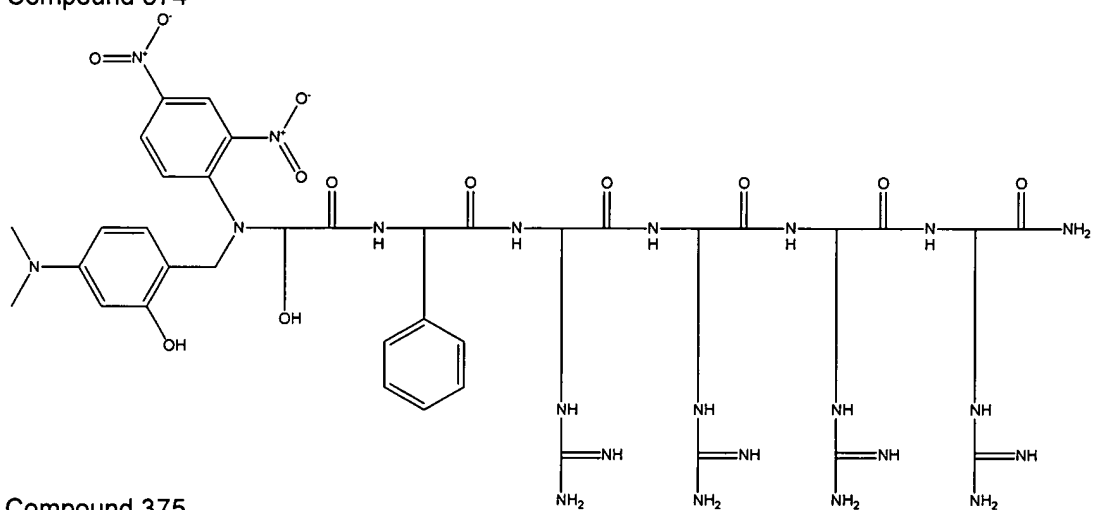


Compound 373

Applicant: David S. Lawrence
Serial No.: 10/755,086
Filed: January 9, 2004
page 162 of 190

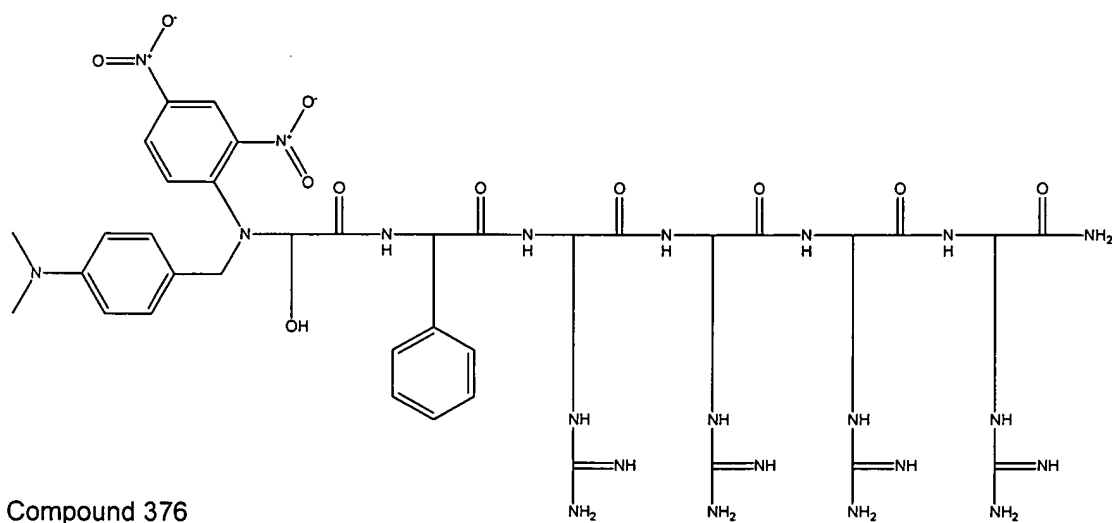


Compound 374

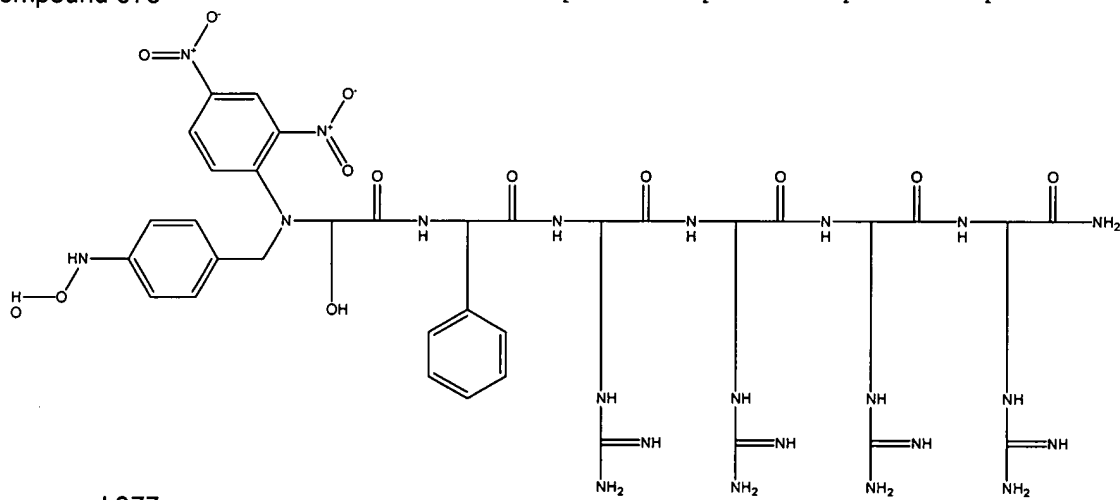


Compound 375

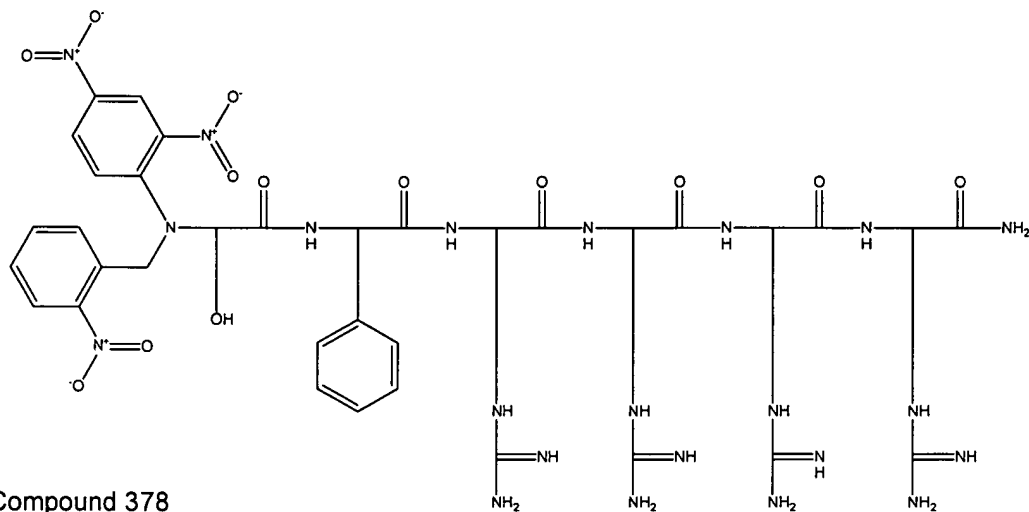
Applicant: David S. Lawrence
Serial No.: 10/755,086
Filed: January 9, 2004
page 163 of 190



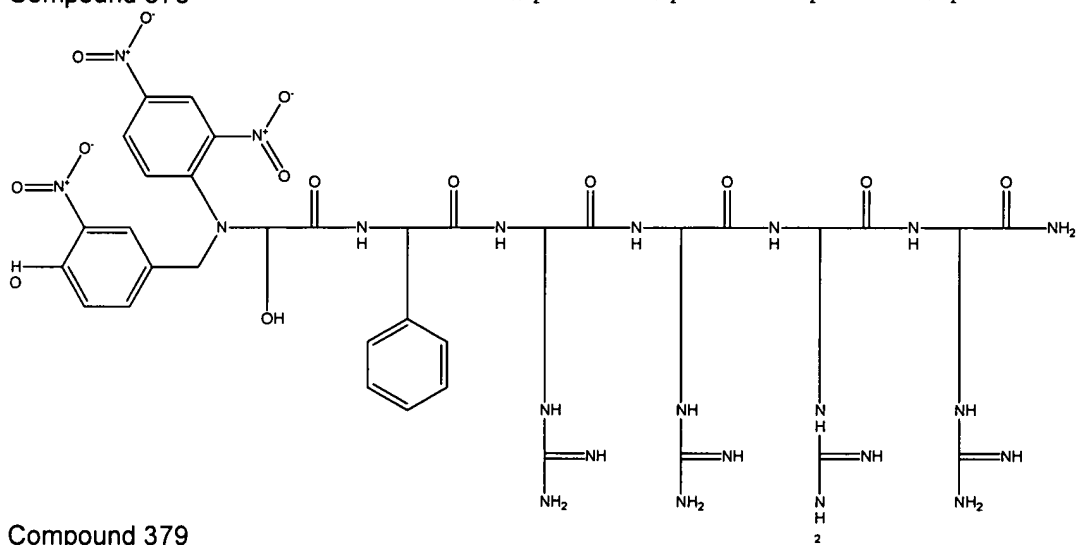
Compound 376



Compound 377



Compound 378



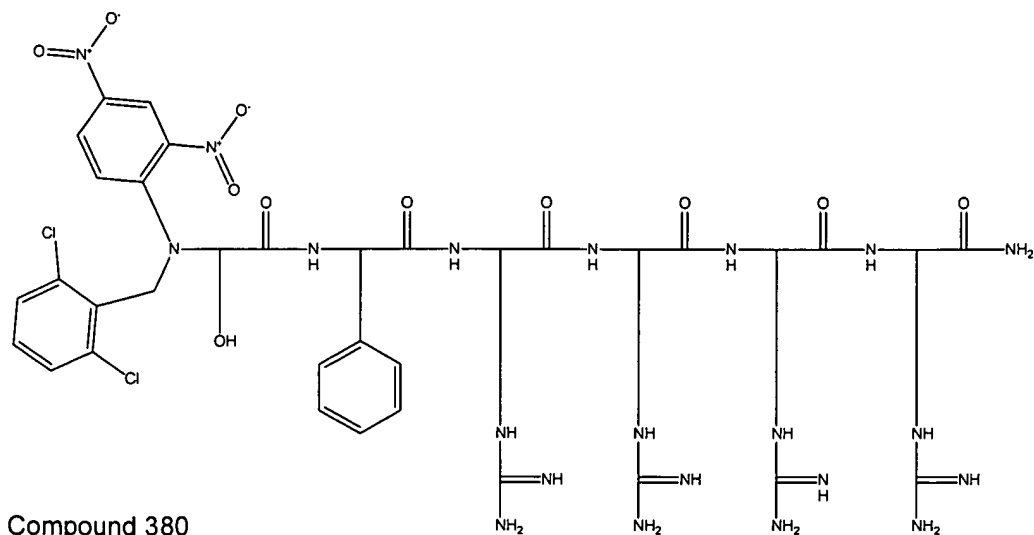
Compound 379

Applicant: David S. Lawrence

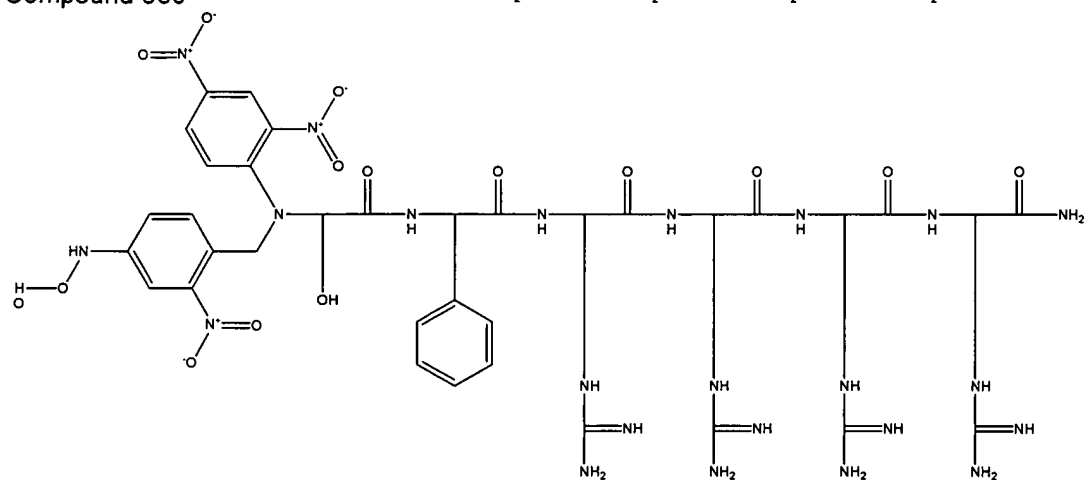
Serial No.: 10/755,086

Filed: January 9, 2004

page 165 of 190

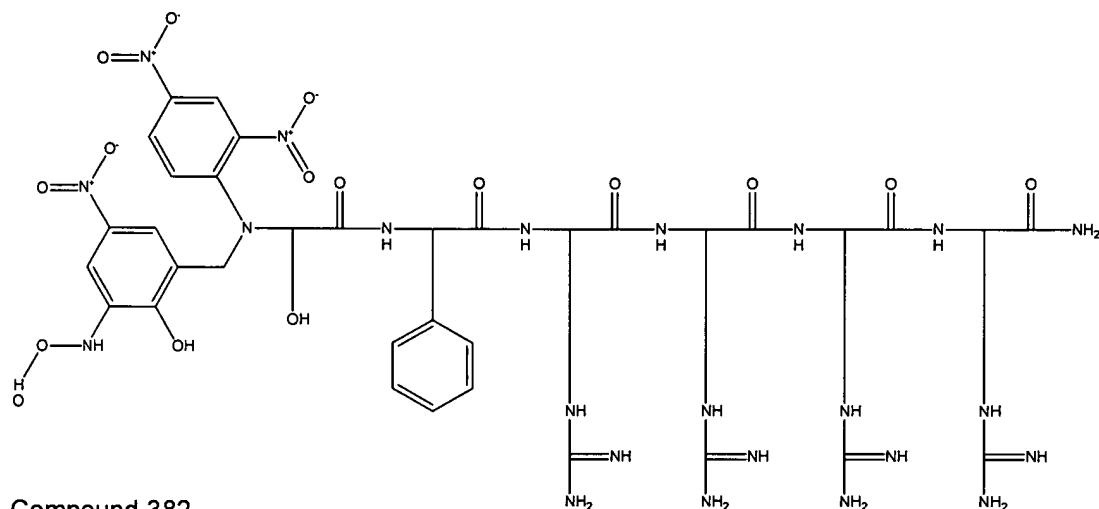


Compound 380

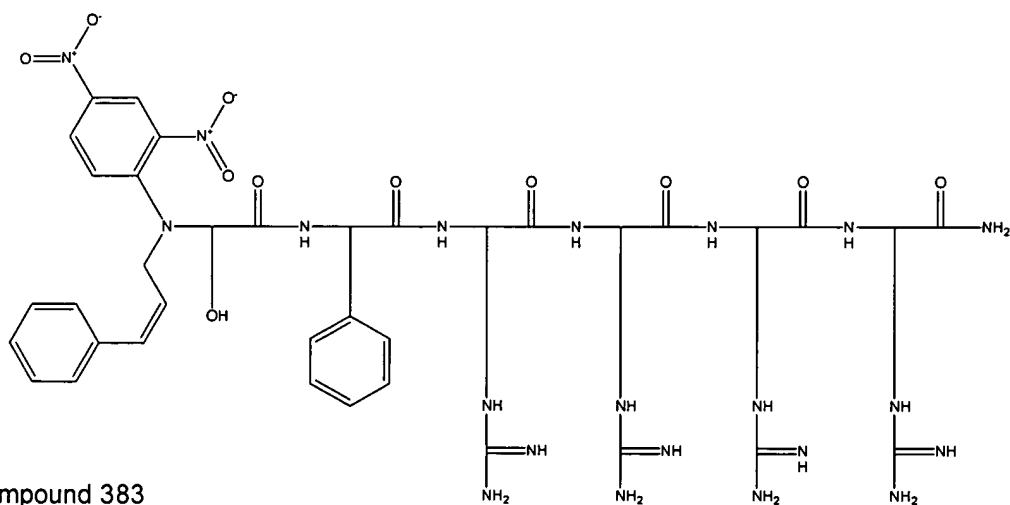


Compound 381

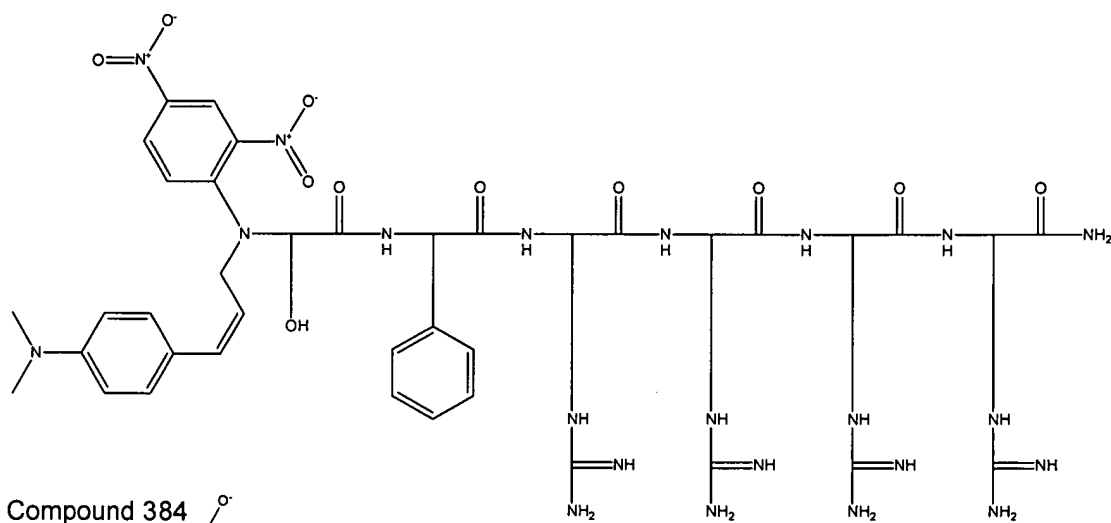
Applicant: David S. Lawrence
Serial No.: 10/755,086
Filed: January 9, 2004
page 166 of 190



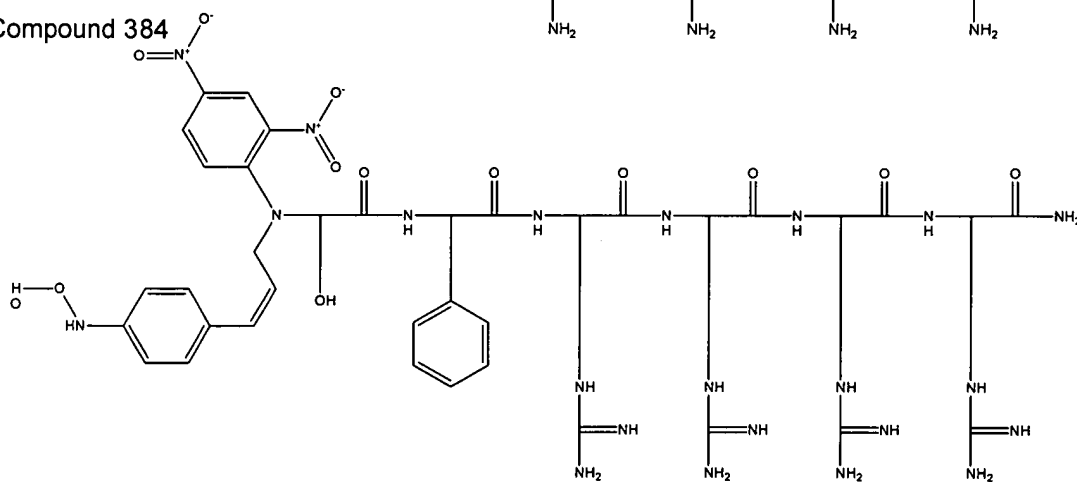
Compound 382



Compound 383

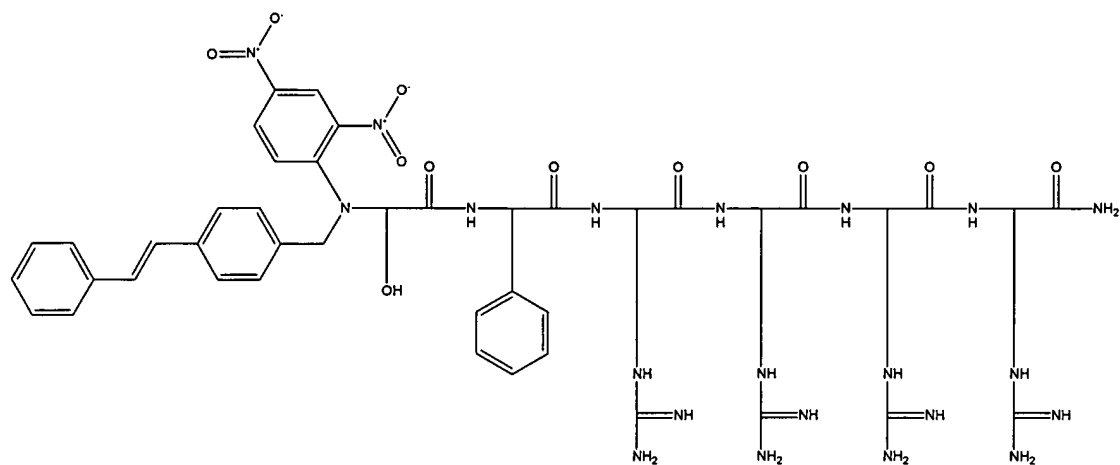


Compound 384

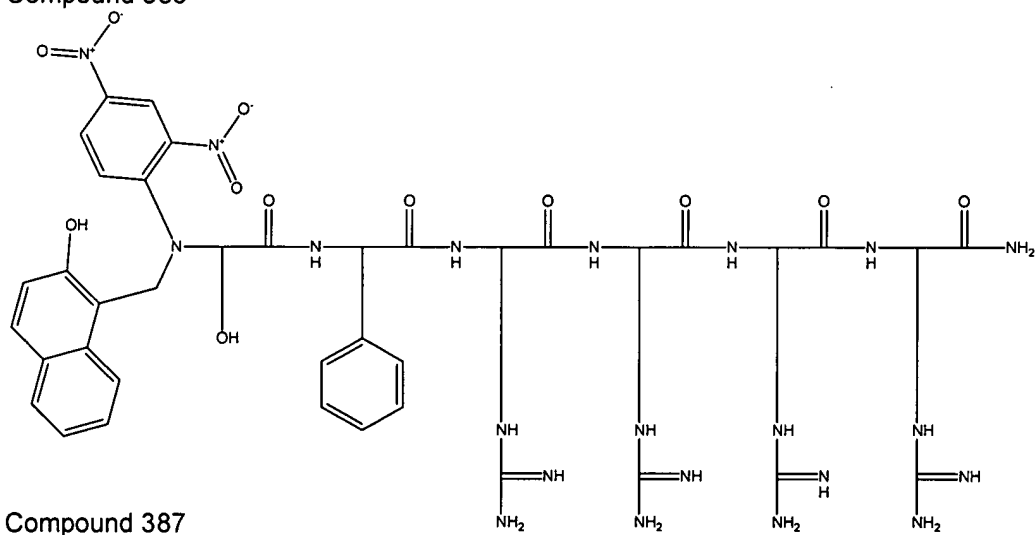


Compound 385

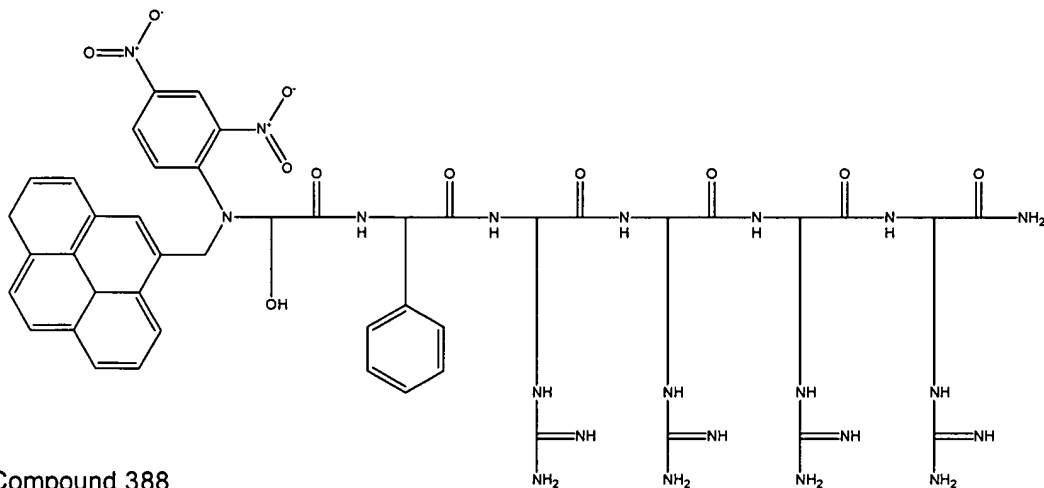
Applicant: David S. Lawrence
Serial No.: 10/755,086
Filed: January 9, 2004
page 168 of 190



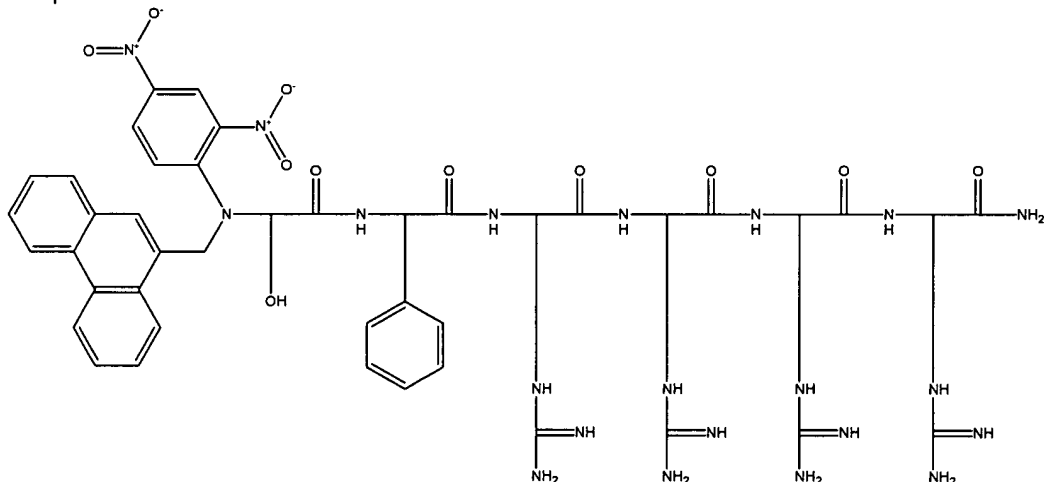
Compound 386



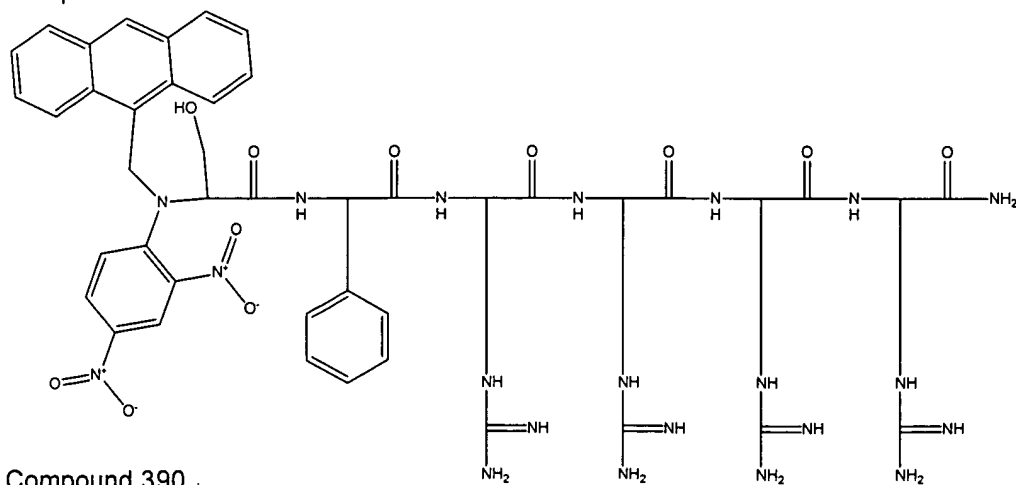
Compound 387



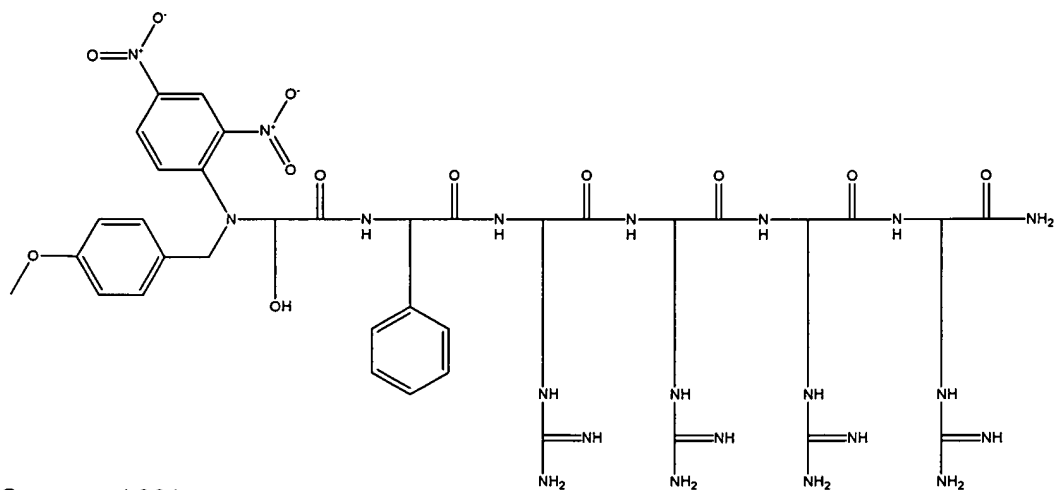
Compound 388



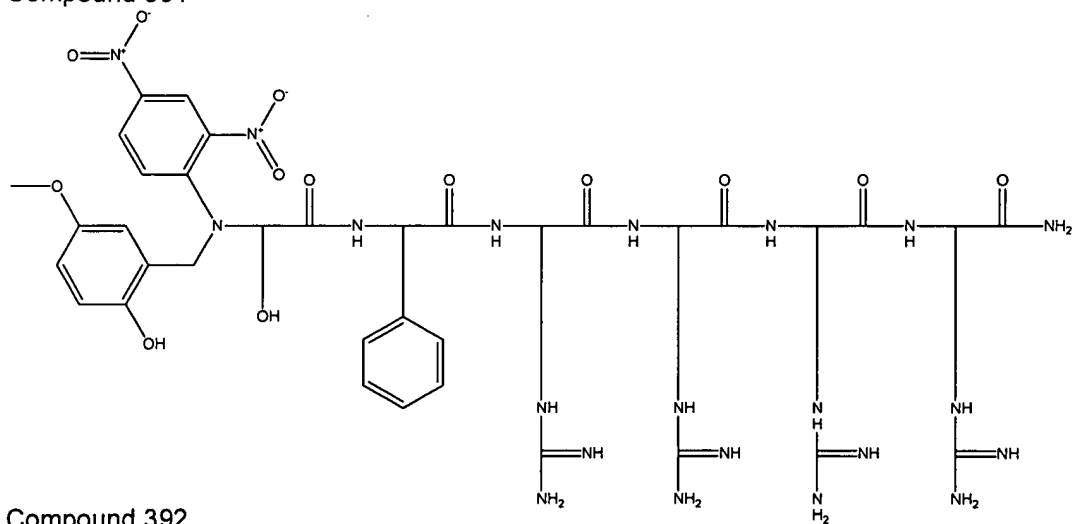
Compound 389



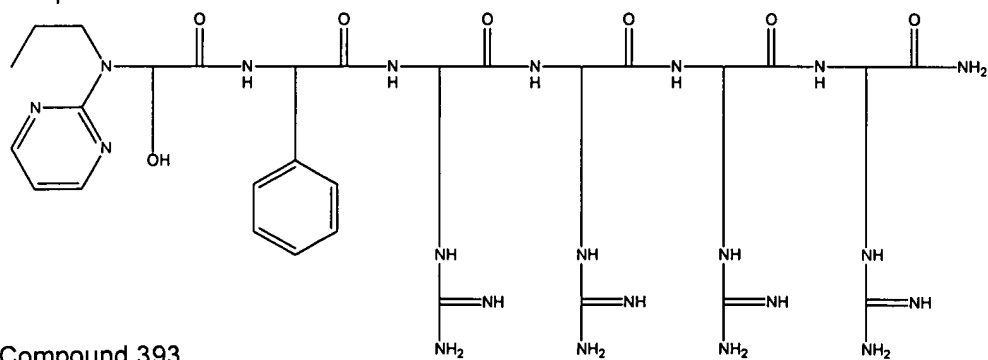
Compound 390



Compound 391



Compound 392



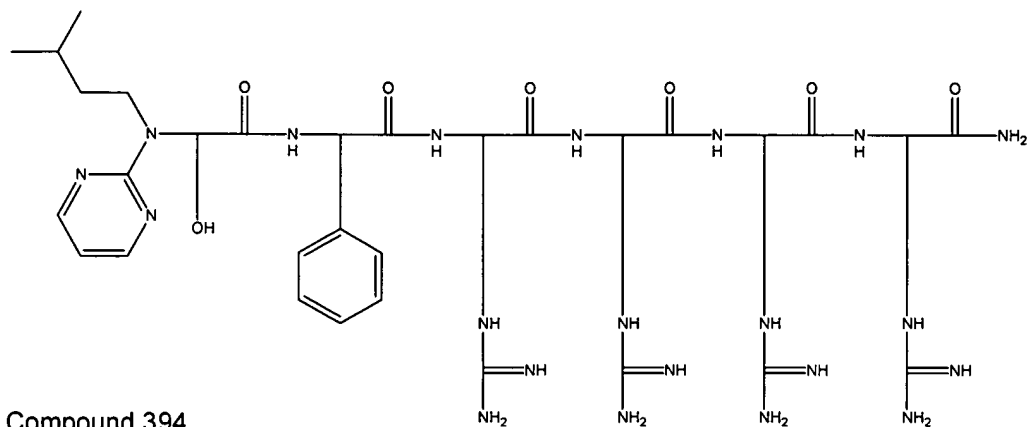
Compound 393

Applicant: David S. Lawrence

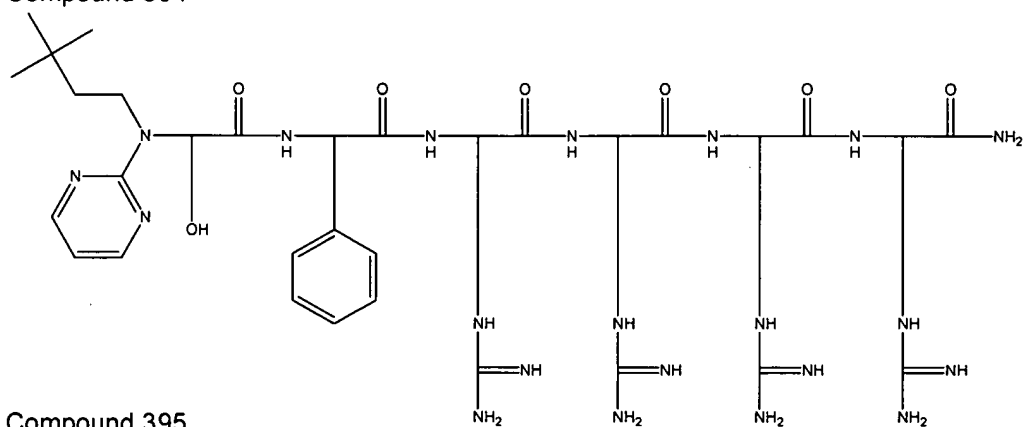
Serial No.: 10/755,086

Filed: January 9, 2004

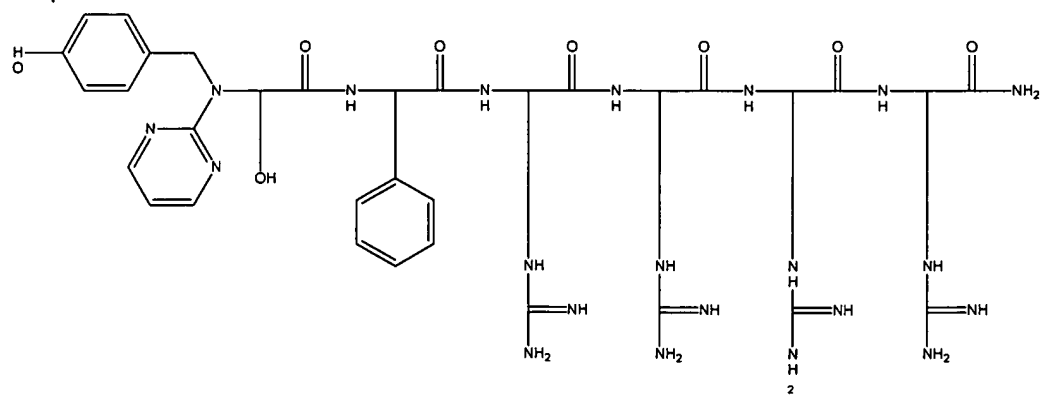
page 171 of 190



Compound 394



Compound 395



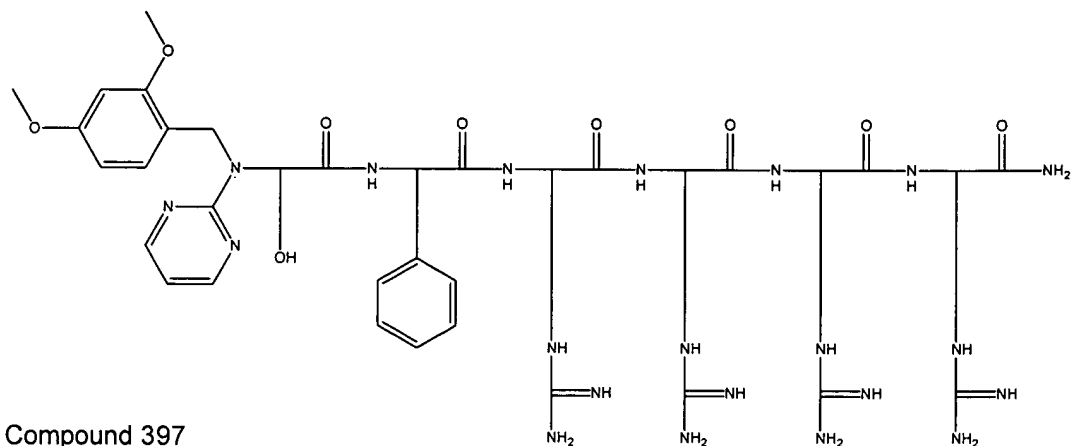
Compound 396

Applicant: David S. Lawrence

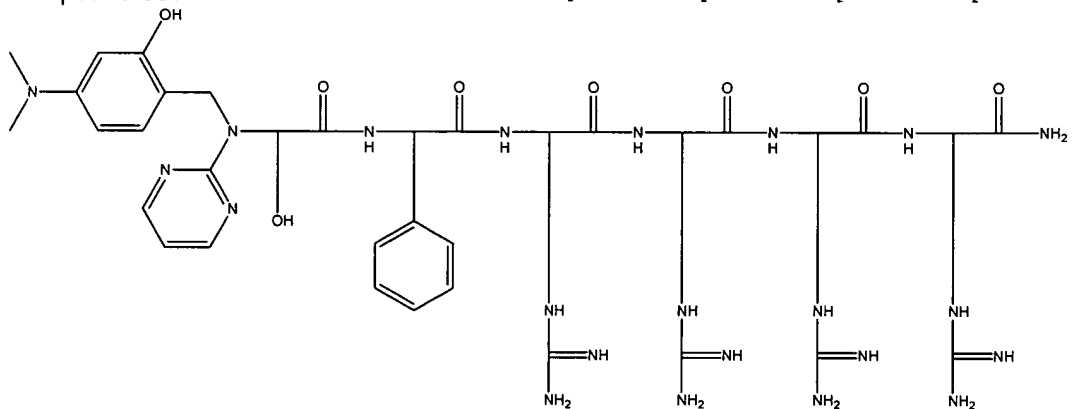
Serial No.: 10/755,086

Filed: January 9, 2004

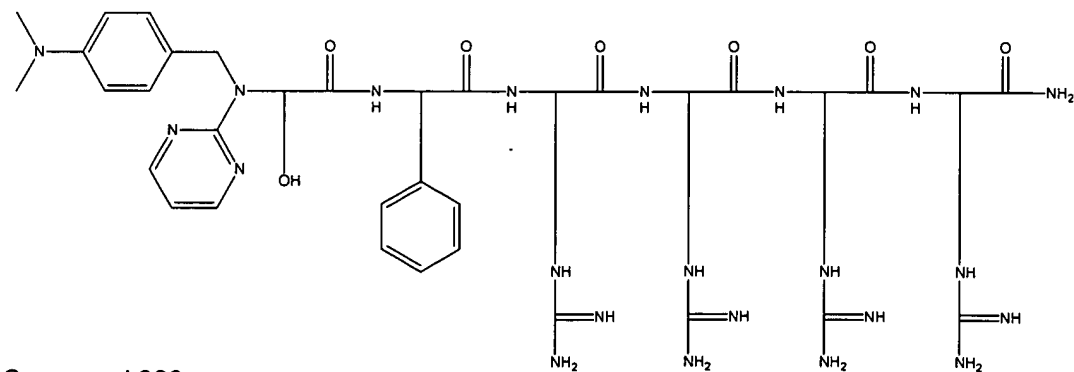
page 172 of 190



Compound 397



Compound 398



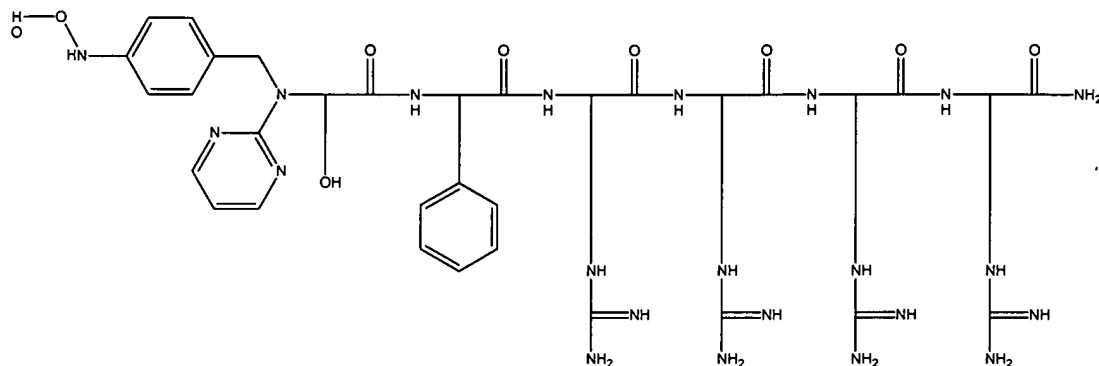
Compound 399

Applicant: David S. Lawrence

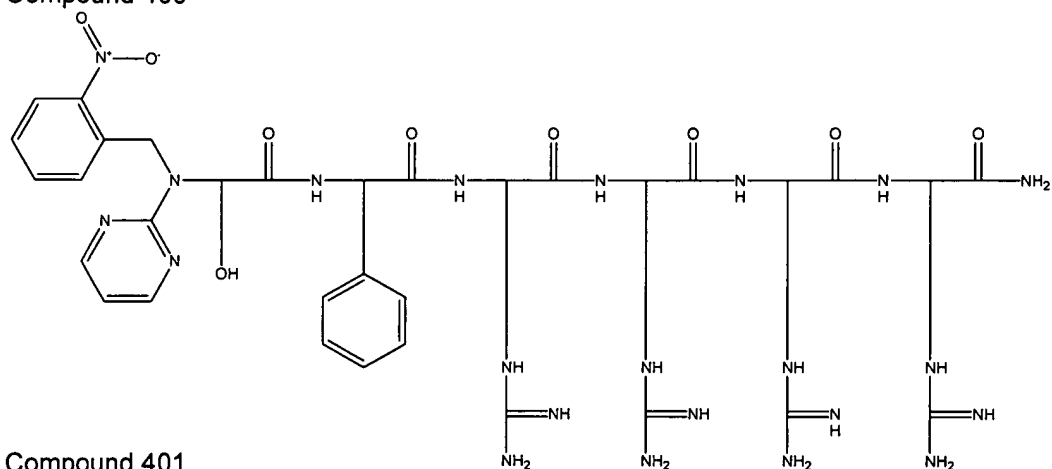
Serial No.: 10/755,086

Filed: January 9, 2004

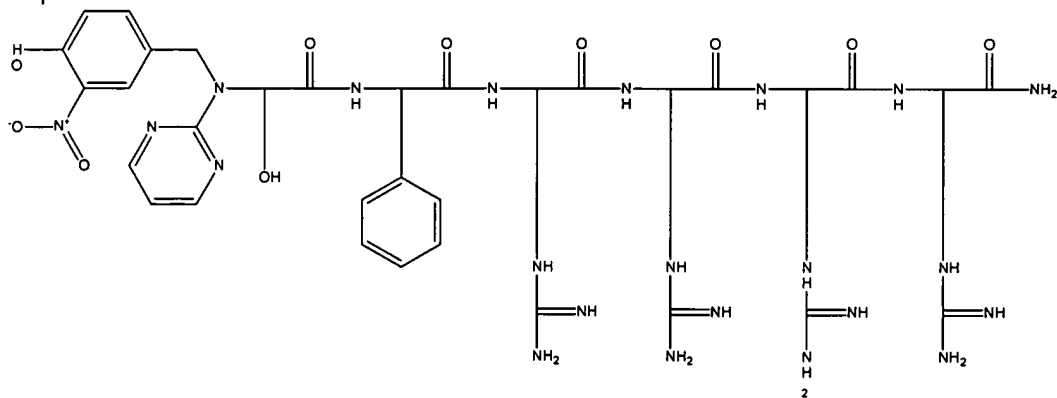
page 173 of 190



Compound 400



Compound 401



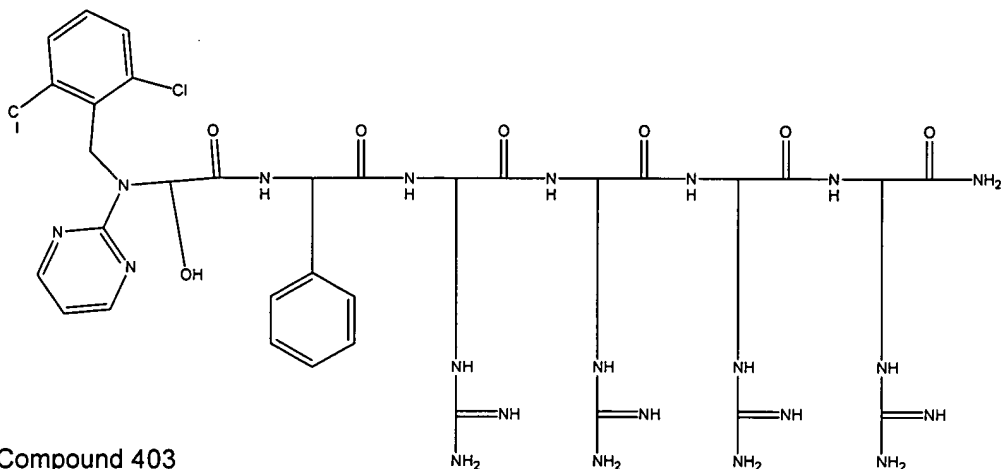
Compound 402

Applicant: David S. Lawrence

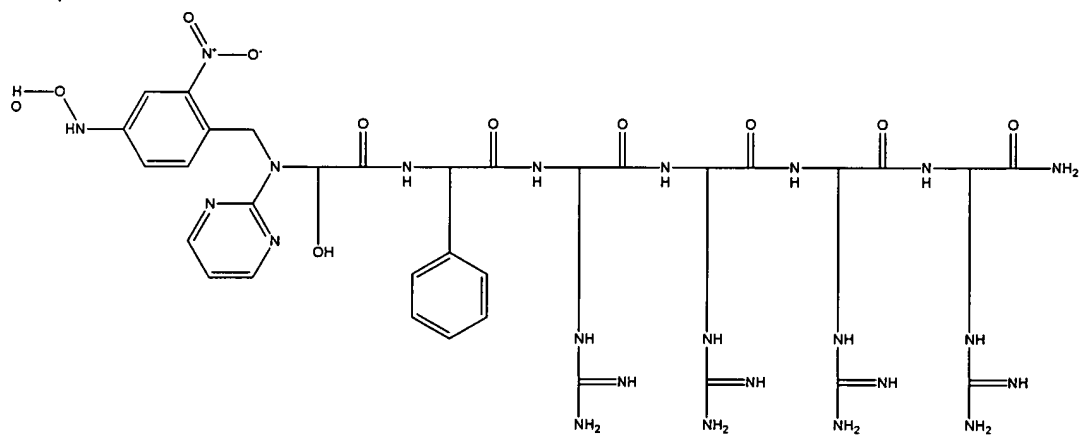
Serial No.: 10/755,086

Filed: January 9, 2004

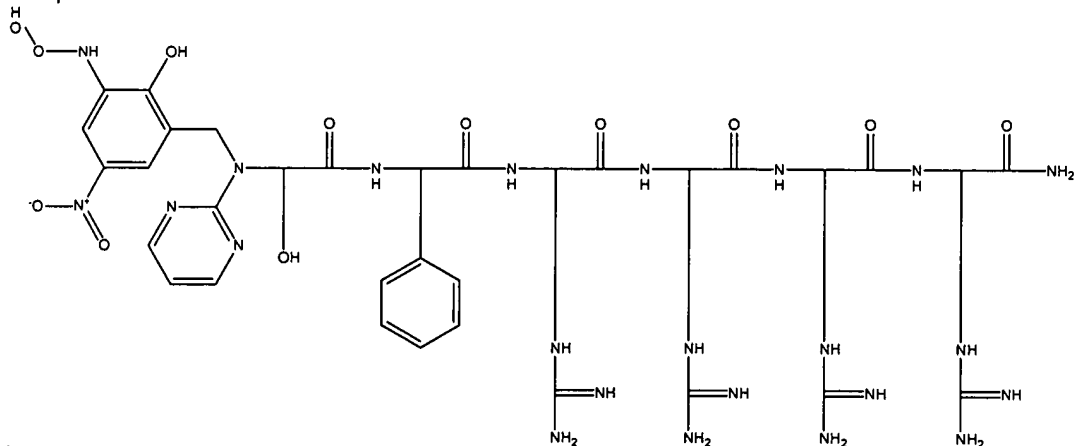
page 174 of 190



Compound 403



Compound 404



Compound 405

page 175 of 190

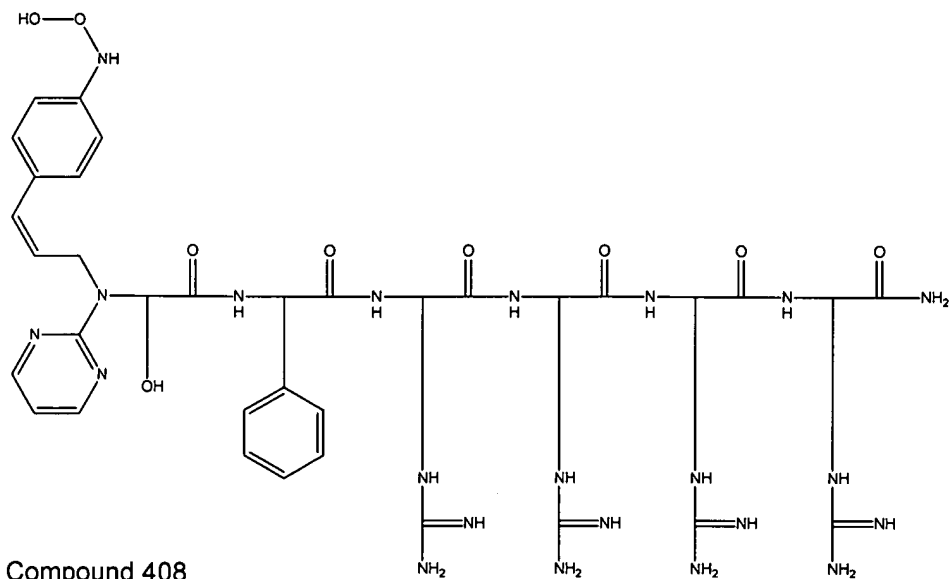


Applicant: David S. Lawrence

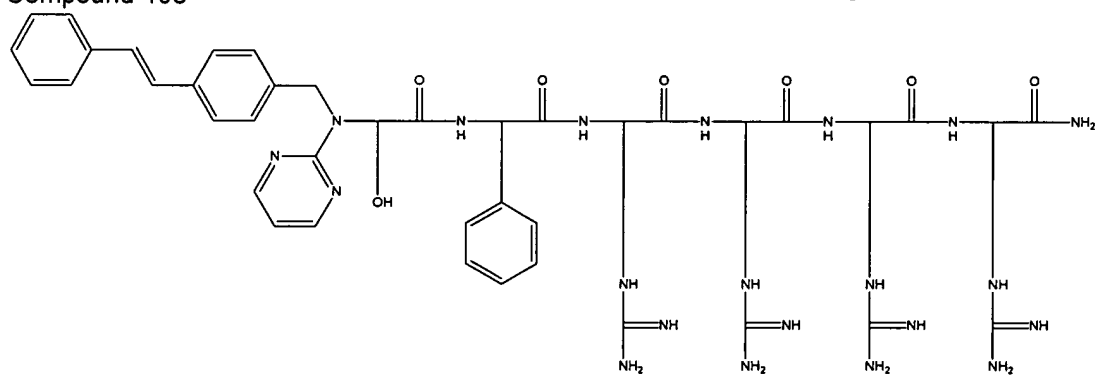
Serial No.: 10/755,086

Filed: January 9, 2004

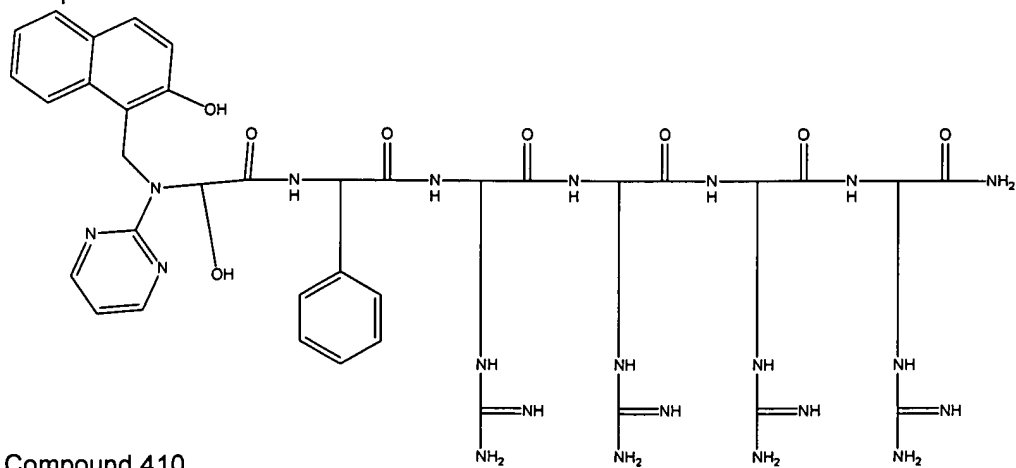
page 176 of 190



Compound 408



Compound 409



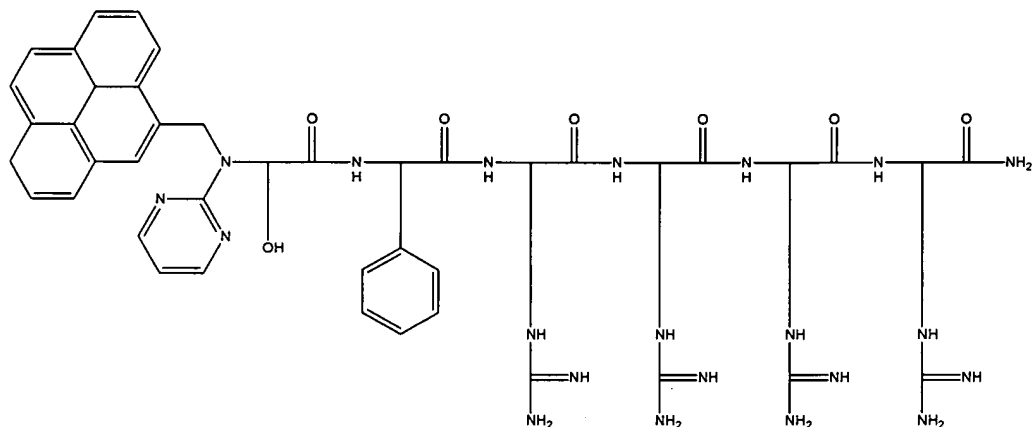
Compound 410

Applicant: David S. Lawrence

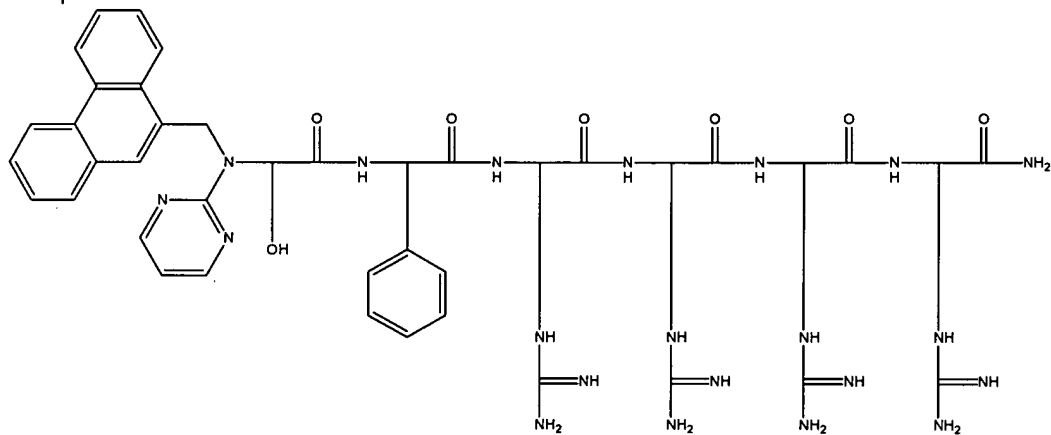
Serial No.: 10/755,086

Filed: January 9, 2004

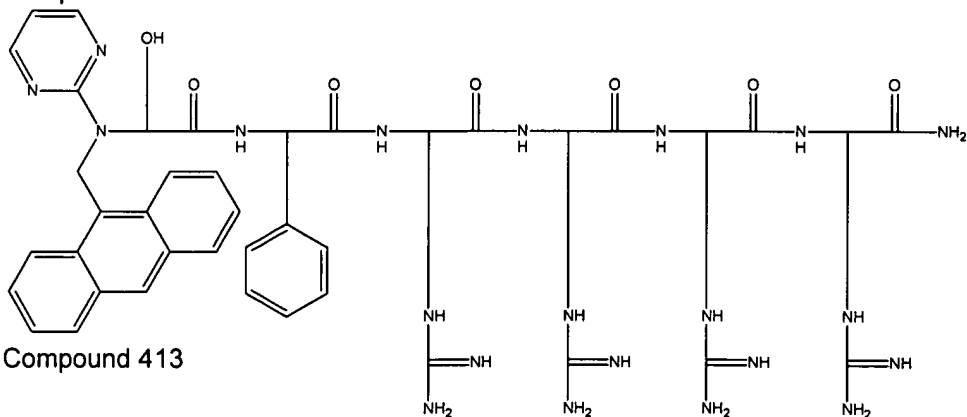
page 177 of 190



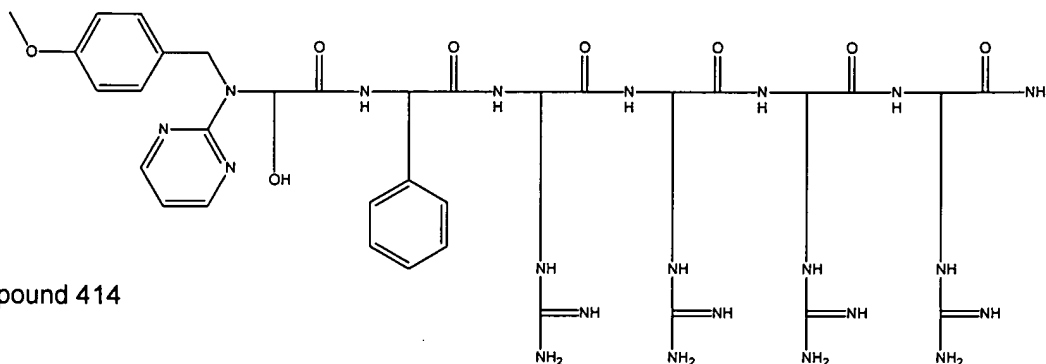
Compound 411



Compound 412

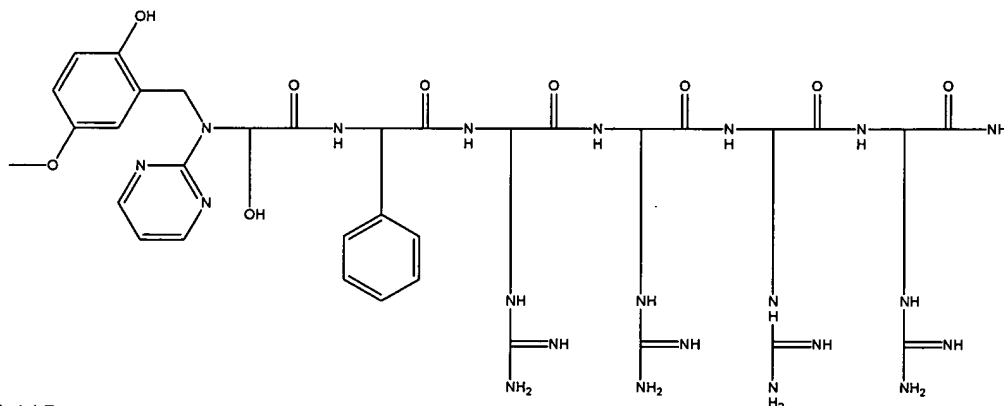


Compound 413



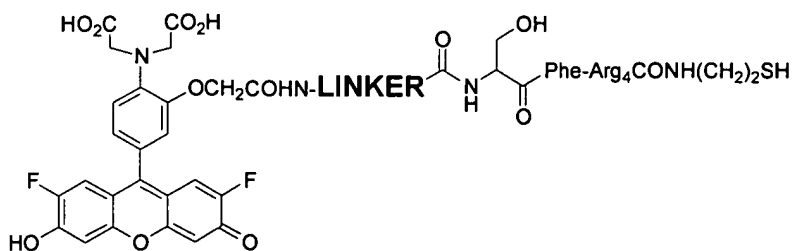
Compound 414

and

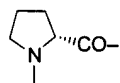


Compound 415

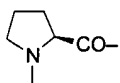
89. (Original) A chemical compound having the structure:



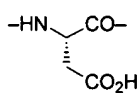
wherein the LINKER is selected from the group consisting of the following:



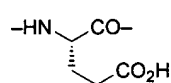
a



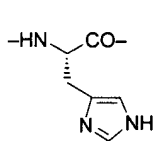
b



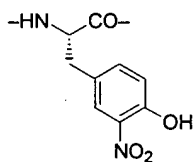
c



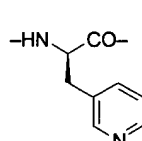
d



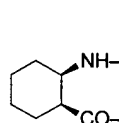
e



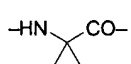
f



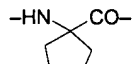
g



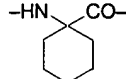
h



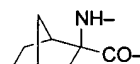
i



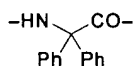
j



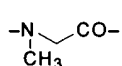
k



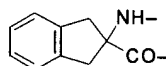
l



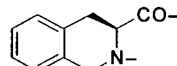
m



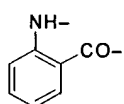
n



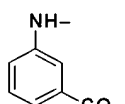
o



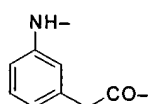
p



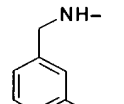
q



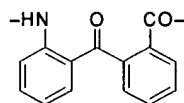
r



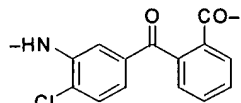
s



t



u



v

no linker

w

90. (Original) A chemical compound having the structure:

fluorophore-LINKER-X-FRRRRK-amide (SEQ ID NO:3);

wherein F is phenylalanine; K is lysine; R is arginine; and X is serine, threonine, or tyrosine.

91. (Original) The chemical compound of claim 90, wherein the fluorophore is a 7-nitrobenz-2-oxa-1,3-diazole derivative.

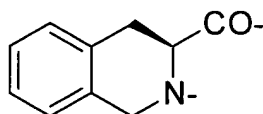
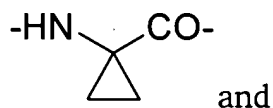
92. (Withdrawn) The chemical compound of claim 90, wherein the fluorophore is a fluorescein derivative.

93. (Withdrawn) The chemical compound of claim 90, wherein the fluorophore is selected from the group consisting of a dansyl derivative, an acridine derivative, an Alexa Fluor derivative, a BODIPY derivative, an Oregon Green derivative, a Rhodamine Green derivative, a Rhodamine Red-X derivative, a Texas Red derivative, a Cascade Blue derivative, a Cascade Yellow derivative, a Marina Blue derivative, a Pacific Blue derivative, an AMCA-X derivative, and a coumarin derivative.

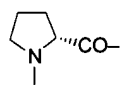
94. (Withdrawn) The chemical compound of claim 90, wherein the linker is a metal chelating linker.

95. (Original) The chemical compound of claim 90, wherein the linker is selected from the group consisting of a carboxamide linker, an aminobenzoic acid linker, a sulfonamide linker, a urea linker, a thiourea linker, an ester linker, a thioester linker, an alkylamine linker, an arylamine linker, an ether linker, and a thioether linker.

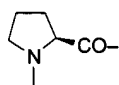
96. (Withdrawn) The chemical compound of claim 90, wherein the linker is selected from the group consisting of N-methyl glycine, L-proline, D-proline,



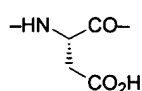
97. (Original) The chemical compound of claim 90, wherein the linker is selected from the group consisting of the following:



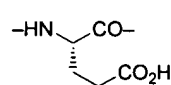
a



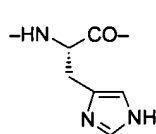
b



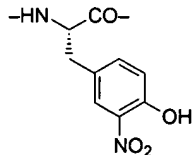
c



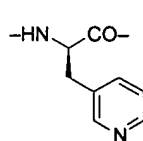
d



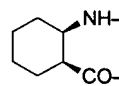
e



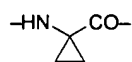
f



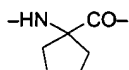
g



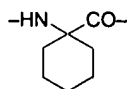
h



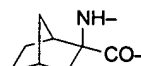
i



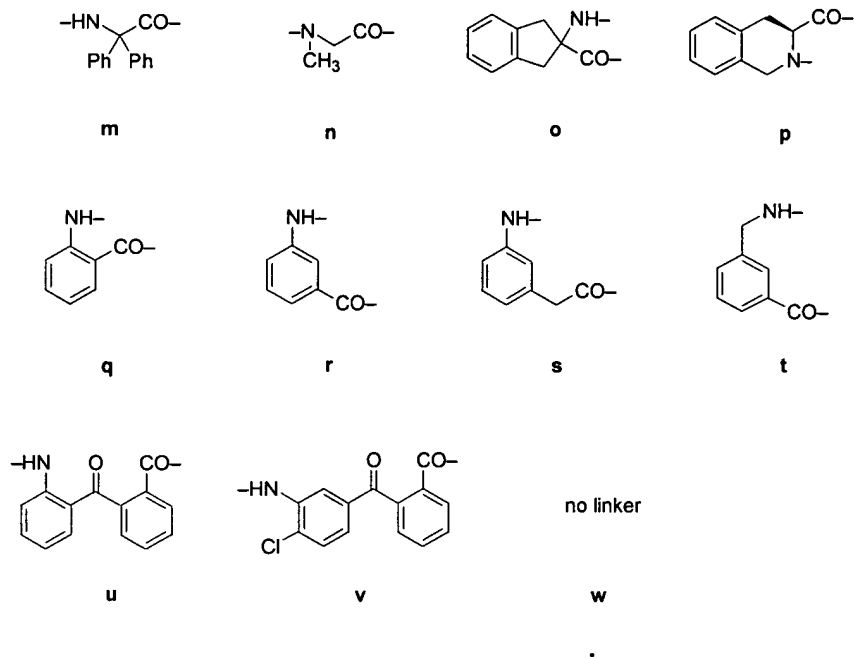
j



k



l



98. (Original) The chemical compound of claim 90, wherein the chemical compound is a substrate for a protein kinase.

99. (Original) The chemical compound of claim 98, wherein the chemical compound is specific for protein kinase C.

100. (Original) The chemical compound of claim 99, wherein the chemical compound is specific for isoforms α , β , and γ of protein kinase C.

101. (Withdrawn) The chemical compound of claim 98, the chemical compound is specific for protein kinase A, protein kinase B, protein kinase D, protein kinase G, Ca^{2+} /calmodulin-dependent protein kinase, mitogen-activated protein kinase, protein kinase mos, protein kinase raf, protein tyrosine kinase, tyrosine kinase abl, tyrosine kinase

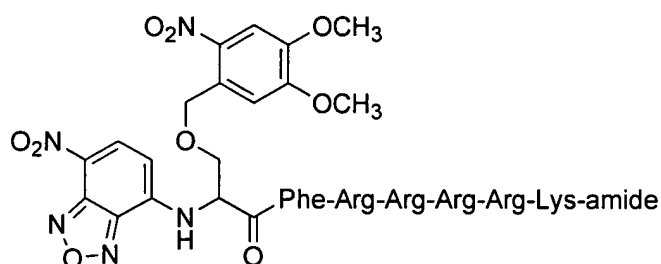
Applicant: David S. Lawrence
Serial No.: 10/755,086
Filed: January 9, 2004
page 183 of 190

src, tyrosine kinase yes, tyrosine kinase fps, tyrosine kinase met, cyclin-dependent protein kinase, or cdc2 kinase.

102. (Original) The chemical compound of claim 90, wherein the chemical compound further comprises a carbohydrate, a lipid or a nucleic acid.

103-121. (Canceled)

122. (Original) A chemical compound having the structure



123. (Previously presented) A composition comprising a chemical compound of claim 89, and a carrier.

124-126. (Canceled)

127. (Previously presented) The substrate of claim 60, wherein the substrate comprises a metal ion chelator.

128. (Original) The substrate of claim 127, wherein the metal ion is a magnesium ion or a calcium ion.

129. (Previously presented) The chemical compound of claim 90, wherein a metal ion chelator induces a change in fluorescence intensity.

130. (Original) The chemical compound of claim 129, wherein the metal ion is a magnesium ion or a calcium ion.

131. (Original) The chemical compound of claim 129, wherein the change in fluorescence intensity is at least a 20% change in fluorescence intensity.

132. (Canceled)

133. (Previously presented) The chemical compound of claim 90, wherein the linker comprises a turn to position the fluorophore in a location closer to the serine, the threonine or the tyrosine than the location the fluorophore would occupy in the absence of a turn in the linker.

134. (Previously presented) The chemical compound of claim 89, wherein the linker comprises a turn to position the fluorophore in a location closer to the terminal serine, the terminal threonine or the terminal tyrosine than the location the fluorophore would occupy in the absence of a turn in the linker.

135-136. (Canceled)

137. (Previously presented) The composition of claim 123, wherein the composition is a pharmaceutical composition and the carrier is a pharmaceutically

acceptable carrier.

138. (Previously presented) A composition comprising the substrate of claim 49, and a carrier.

139. (Previously presented) The composition of claim 138, wherein the composition is a pharmaceutical composition and the carrier is a pharmaceutically acceptable carrier.

140. (Previously presented) A composition comprising the compound of claim 88, and a carrier.

141. (Previously presented) The composition of claim 140, wherein the composition is a pharmaceutical composition and the carrier is a pharmaceutically acceptable carrier.

142. (Previously presented) A composition comprising the compound of claim 90, and a carrier.

143. (Previously presented) The composition of claim 142, wherein the composition is a pharmaceutical composition and the carrier is a pharmaceutically acceptable carrier.

144-145. (Canceled)

146. (Previously presented) A composition comprising the compound of claim

Applicant: David S. Lawrence
Serial No.: 10/755,086
Filed: January 9, 2004
page 186 of 190

122, and a carrier.

147. (Previously presented) The composition of claim 146, wherein the composition is a pharmaceutical composition and the carrier is a pharmaceutically acceptable carrier.

148. (New) The substrate of claim 56, wherein a photolabile side chain is attached to the serine, the threonine, or the tyrosine on the terminal end of the peptide, wherein the photolabile side chain blocks transfer of a phosphoryl group from adenosine triphosphate to a hydroxyl moiety of the serine, the threonine, or the tyrosine so that the substrate cannot be phosphorylated by a protein kinase until the photolabile side chain is removed from the substrate.